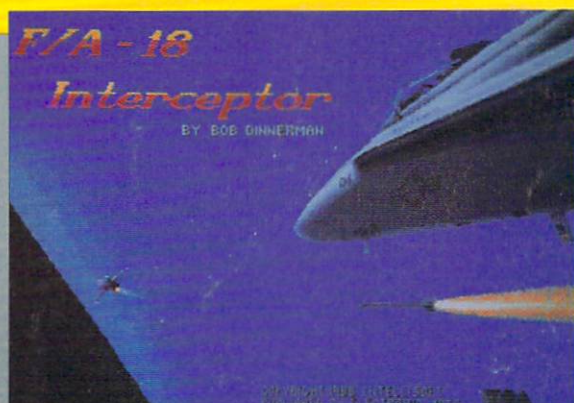
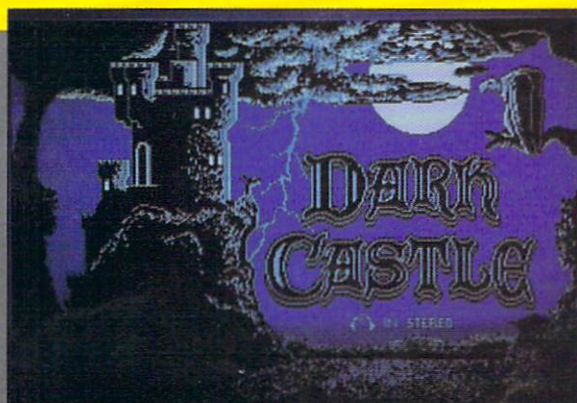
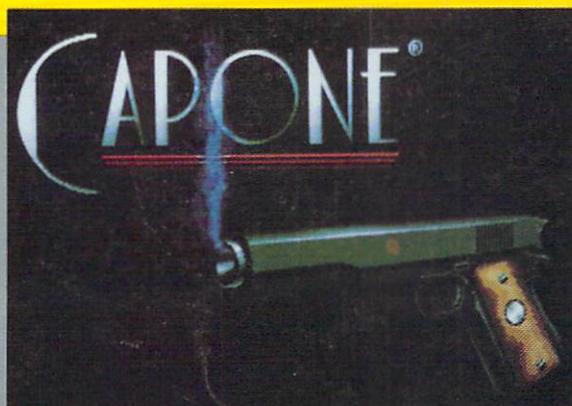


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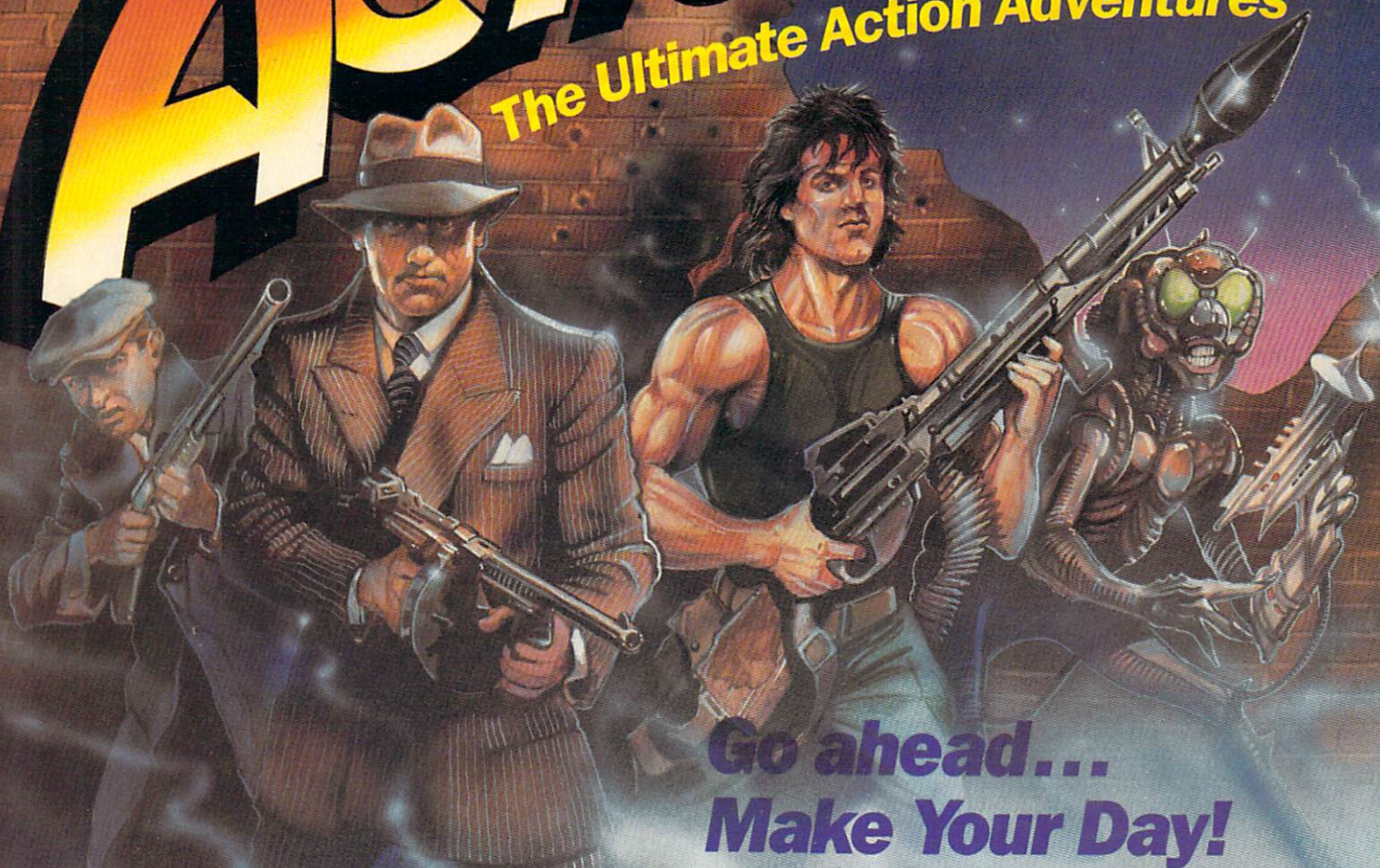
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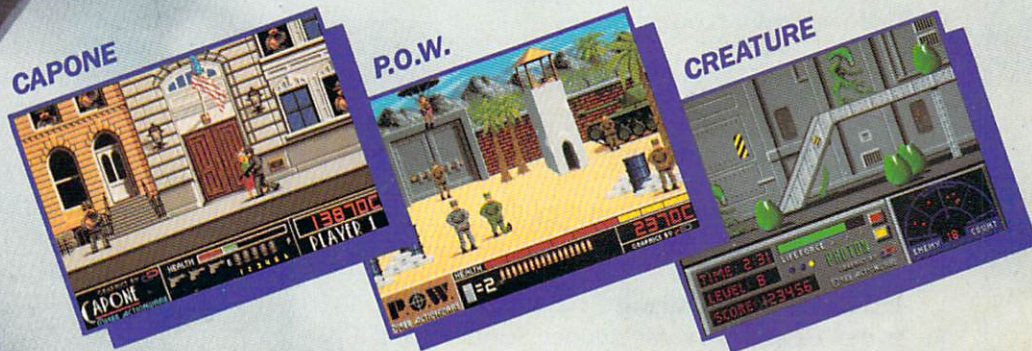


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Dear Amazing Computing,

The article "Interactive Startup-Sequence" by Udo Pernisz (AC 3.5) clarifies the use of some more rarely-seen CLI commands and offers some nifty listings. When I ran into the need to use varying system configurations I concocted the following. It requires many fewer commands and in some cases is more versatile than the technique used in the article.

```
. ;pathadds, addbuffers, setmap
. ;setclock go here
.
PATH Ram: ADD ;these just speed things up
COPY c/Copy to Ram: ;(i use this format to avoid
COPY c/Ask to Ram: ;CD to c, so the system will
COPY c/ If to Ram: ;use Copy from Ram:)
COPY c/Endif to Ram:
COPY c/Run to Ram:
.
COPY otherstuff to Ram: ;stuff you usually put in Ram:
.
Ask "Browser?" ;displays the string in quotes
;user enters "Y" or "N"*
IF WARN THEN ;if the user entered "Y"
Run Browser ;run this program
ENDIF
ASK "next filename?"
IF WARN THEN
RUN next filename
ENDIF
. ;and so on...
.
. ;i like to keep the CLI
QUIT
```

Stepping through the list takes only seconds and it is very easy to modify as you find new goodies to use. The only caveats I am aware of are to RUN each object and order the objects as they must be added to the system. For instance, I use Nag4 (a calendar/reminder) which must be started after the WorkBench if Wb is used, so Nag follows LoadWB in my sequence. Nested ASK commands would handle objects that only work in certain environments, ASKing if you wanted them run only if the proper configuration was established.

ASK is a very useful command that I have seen referred to only once in a magazine, and not at all in any AmigaDOS manual.

Gerald Morris
California

P.S. Great magazine: enough tough stuff to stretch my grayish matter and enough easier stuff to reassure me I know a little of what I'm doing.

Thanks for the insight. CLI is a very capable environment which has yet to be fully tapped by most users. The Amiga has taken the best from the two giants (IBM & Macintosh) of the personal computer industry and offered us a great way to build a system designed the way we want it.

(continued on page 6)

Amazing COMPUTING

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(continued from page 4)

Dear Amazing Computing,

More and more programs require 512K of memory and if you have a second disk drive hooked up, they will not run. Unhooking DF1 is quite a hassle and repeated plugging/unplugging could cause damage sooner or later.

Open up the connector where DF1 plugs into the Amiga, and cut the brown wire. Solder a small on/off switch to the two ends. I used a Radio Shack switch, (cat#275-645). Bend the tabs 90 deg. and it will just fit in the rear left (facing the connector).

Now cut the switch off, reset the computer and you have disconnected df1. Switch it back on then reset, and all is as it was.

My friend from Canada, (thanks Charlie), told me about this hardware hack, and I have been using it for some time and have had no trouble at all. Commodore should have mounted the switch on the front panel of the disk drive to take care of this problem, but at least this hardware hack works.

Also, Rene Glardon, founder of International Commodore Club Geneve would like all Commodore users to write, so a world directory of all Commodore users can be made. Quite a project if I do say so myself. So let me print their full address:

International Commodore Club Geneve
74 ave. Eugene Lance
CH-1212 Grand-Lancy
Switzerland

That's all for now,
Danny Barton
Louisiana

As of press time, we were not able to verify this procedure on our own equipment. We have included this fix as an aid to any Amiga user who needs it, but with no implied warranty by Amazing Computing or PiM Publications, Inc. Please do not forget this procedure violates any warranties from Commodore. However, if your warranty has expired.....

Dear Sir:

Re: Roomers

Amazing Computing
Vol 3 No 6, June 1988

We at MicroIllusions are very disappointed that a magazine the caliber of yours would print a "roomer" without checking all the facts prior to publication.

While it is in fact true that Oren Peli is going into the Israeli army (a happening several months off), it is most emphatically not true that this fact has sounded the death knell for Photon Paint II!

Photon Paint 2.0 is within one week of completion. And if it were not done by the time Oren entered the service, do you honestly believe that out of 70 programmers we have working on our products, one of the other 69 would not be able to complete the product?

We feel that in fairness to MicroIllusions a retraction of this "roomer" is in order.

Sincerely,
James A. Steinhert & Staff
President
MicroIllusions

We must extend an apology for our oversight. Not for the printing of the ROOMERS column, but for the absence of the following disclaimer which should appear in the ROOMERS column each month:

[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of Amazing Computing™ cannot be held responsible for the reports made in this column.]

It was never our intent nor our desire to make the ROOMERS column a reviewed and pursued piece of journalism. ROOMERS, as its name implies, is the compilation of whispers, hints, and gossip collected by an independent, third party observer. This person is not a member of our central staff and the bandito's identity remains unknown.

For this reason, no passage in the ROOMERS column is checked with anyone. If the column was verified, the reports would not be rumors; rather they would be facts and would belong in another area of AC.

However, we are not unresponsive to a "bad" or "misinformed" rumor. If anyone has a competent and earnest reply to anything in Amazing Computing, we want to hear. Please write us so we can correct any errors.

Thank you for your correction and please accept our apology for the misplaced disclaimer.

Dear Amazing Computing,

Please note that our all-Amiga BBS recently moved. We would appreciate it if you could please print this updated information:

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Frank (408) 423-7056

Thank You,
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•AC•

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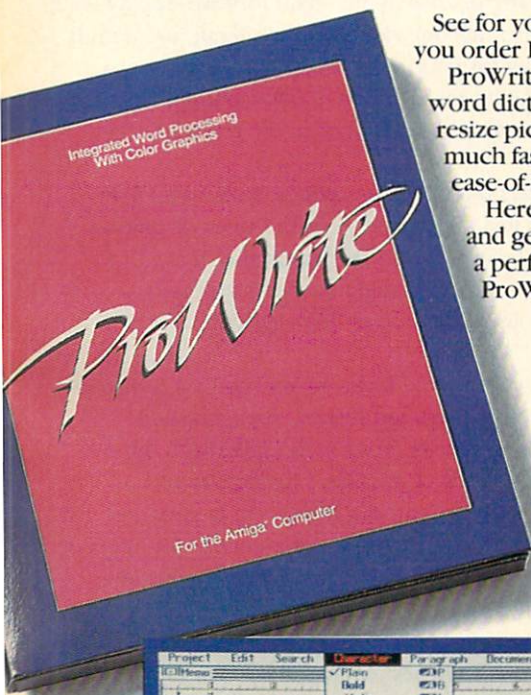
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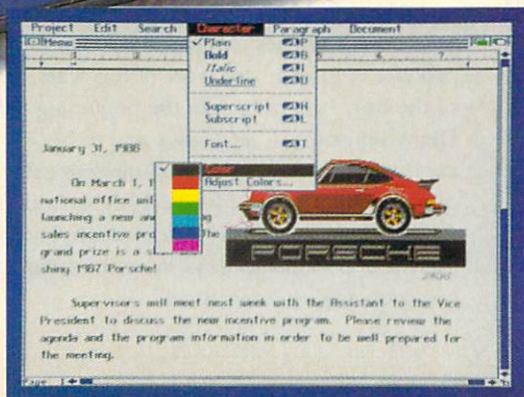


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by Steve Hull
People Link: St. Ephen
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Take Five!

JET vs. F/A-18 INTERCEPTOR: CLASH OF THE TITANS

Over the years, SubLOGIC has virtually defined microcomputer flight simulation. The term "phenomenally successful" doesn't seem to do its Flight Simulator II justice; FSII has sold over a million copies in eight machine translations, spending years at the #1 position of Billboard magazine's software sales chart.

If Amiga owners eagerly awaited the translation of FSII, they were positively rabid with anticipation over SubLOGIC's followup, Jet—you might say it "flew" off the shelves.

One suspects the lesson was not lost on Robert Dinnerman, a hardware and software engineer whose tours of duty range from Motorola to Bally. Impressed with an Evans-Sutherland flight simulator, Dinnerman decided to see how closely he could duplicate it on a personal computer. Which computer? There was really only one choice—so F/A-18 Interceptor was born on the Amiga under the protective wing of Electronic Arts.

Jet or F/A-18 Interceptor: which one's for you? It depends on what you want. Both games let you fly the ground-based F-16 or carrier-based F/A-18 in

free-flight or various combat scenarios. Beyond that common ground, each takes a unique approach with corresponding strengths and weaknesses.

Jet, as you might expect, is first a flight simulator, and a game second. Its documentation is profuse and offers so many control and view options that the keyboard map appears quite intimidating. It isn't as bad as it looks; Jet uses most Amiga keys, but whole blocks are set aside for different views.

Jet's display options are impressive. Besides the standard out-of-the-cockpit views, you can select several external views that allow you to watch your own aircraft as it appears to a spotter plane or the control tower. You can select a missile's eye view, which acts as a camera at the head of a fired missile—an interesting way to view a dogfight! Multiple window views are also possible; you can, for example, overlay the main forward display with a smaller, spotter view of your aircraft, use a third window for your radar, and a fourth to show a map. Up to ten different window configurations can be stored and recalled at the touch of a key.

Jet offers ten difficulty settings, from Level 0, in which it is impossible to crash (a power dive at Mach 1 simply bounces you off the runway), to Level 9, where crashing becomes a distinct possibility if the bogies don't eat you alive first!

In addition to free-flight, several combat missions are available: ground strikes, dogfights, and combined attacks. Your jet is armed with three different kinds of missiles, plus bombs and machine guns. You can lock on to targets, and then fire and forget...but so can the enemy. Jet offers no countermeasures, so evasive action is your only defense.

One of Jet's greatest strengths is that it is an "open" product. You can have a lot of fun with it right out of the box, but that's only the beginning. Like Flight Simulator II, Jet allows you to hook up to another Amiga through a null-modem cable or over phone lines. Besides formation flying with a buddy, the hook up also allows you to dogfight against a human opponent—always more interesting than going up against a machine!



Jet

SubLOGIC's scenery disks may also be used with Jet. Some would-be anarchists have complained that the scenery is only partially interactive; that is, although you can fly under bridges, you can't blow them up as the game allows in its combat scenarios.

SubLOGIC recently introduced a new scenery disk covering Western Europe that allows you to fly over Stonehenge or to squeak through Paris' Arc de Triomphe (not for the shaky of joystick). There is one more area included on this disk: Moscow. Its coordinates are not listed. If you can land in Red Square and send the coordinates to SubLOGIC, you are eligible to win a real flight to Europe!

THE CHALLENGER

F/A-18 Interceptor, by Electronic Arts, is a different breed of animal in many ways. Unlike Jet, it is a completely closed product and likely to stay that way. There is no facility for modem play, nor does the range of scenery ever get very far from the San Francisco Bay area. EA company representatives deny any plans to expand the product—a policy in line with the treatment of previous EA game titles. In other words, what you see is all you're likely to get.

But what you get is incredible. From the initial title screen with its brooding soundtrack, the designers' sense of drama is evident. F/A-18 Interceptor's approach is different not just from Jet, but from all combat titles that have gone before it; the result is the most involving simulation you've ever seen.

Unlike Jet, which at times has the feel of a rather sterile shooting gallery, F/A-18 Interceptor takes a cinematic approach to combat simulation. The way each product handles a mission is a good example. In Jet, you select a mission—dogfight, ground strike, or combined—from the main menu, and the next moment you're taxiing out of the hangar. In F/A-18 Interceptor, selecting a mission brings up a map view of the combat area. As a low, foreboding note sounds from your stereo, the details of the mission teletype across the screen—and

these are not simply dispassionate shoot-'em-up scenarios. In one mission, for example, you must intercept enemy aircraft that have crippled Air Force One and are preparing to finish it off; in another, you must chase down and destroy a cruise missile before it detonates over Moffatt Field.

Once you have read the mission briefing, you must enter a security countercode from a three-part code wheel included with the package. (In a first for EA, the game disk is not copy protected). The text disappears from the map, and the game performs the most dizzying zoom shot you've ever seen—from a satellite's view of the action to a viewpoint next to your aircraft on the deck of the carrier! This is typical of how F/A-18 Interceptor sets the mood for what is to come; your pulse starts pounding before the crew chief pulls the chocks!

From the wind whistling across the flight deck to the convincing scream of the turbines and the whine of the gear being retracted, Interceptor's sound effects are the finest of any simulator to date. Though the game can be played on a system with 512K RAM, you need a full megabyte to experience all the sounds.

Interceptor's graphics are very good, and screen refreshes are fast, even with many

moving objects on screen at once. The Heads Up Display (HUD) is a pleasing study of less-is-more, but the documentation of certain features (such as use of the aiming device and range marker) is a frustrating study in less-is-less.

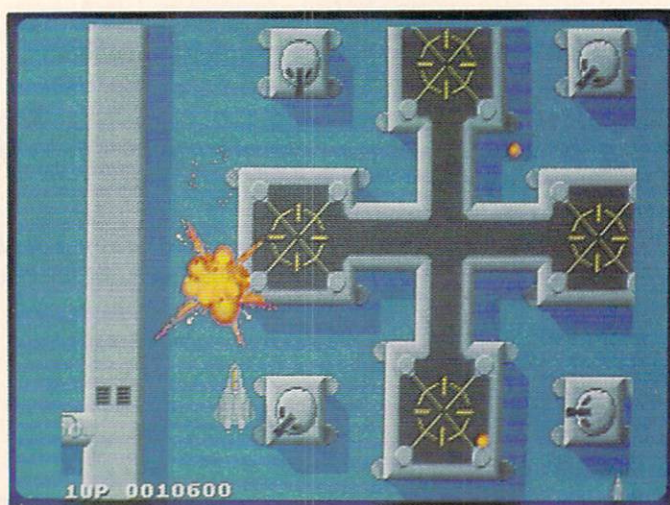
One area that has forced many people to shy from flight simulators is the difficulty of learning maneuvers; despite Flight Simulator II's fine documentation, learning to perform an Immelman turn from a diagram is like learning to swim by reading a book. F/A-18 Interceptor's got training covered too; in training mode, you follow your instructor's plane into the air and through seven aerobatic maneuvers. If you lose the instructor, the return key puts him back in front of you.

There are six scenarios on the F/A-18 Interceptor game disk, though you cannot initially access them all. You must qualify to move from one mission to the next through successful completion of each scenario in sequence. Mercifully, you can begin at the fourth mission, but you must earn your way to the fifth and sixth. The sixth, by the way, is quite a bear—I have seen battle-hardened veterans reduced to quivering hulks just trying to figure out how to complete it. A hint, for those who haven't conquered the shadow sub: Missiles don't have to be guided. Use the Force, Luke.

(continued)



F/A-18 Interceptor



Sidewinder



Mission Elevator



AAARGH!

There is no question as to which is the better game. F/A-18 Interceptor offers superior graphics, sound, and a sense of drama that Jet lacks. As for which is the better simulator, only a real fighter pilot is likely to know, or, for that matter, care. Jet is an excellent product, but F/A-18 Interceptor is simply astounding. It blows everything that has come before it out of the sky.

AAARGH

Epyx did it first; Crush, Crumble and Chomp was the classic Commodore 64/Atari 800 game that turned the tables. Instead of defending helpless metropolises against rampaging monsters, CC&C let you be the monster. A great game, though the scariest part was waiting for the cassette version to load.

Arcadia updates the theme with style in their latest release, AAARGH. In AAARGH, you vandalize buildings, spread havoc throughout the countryside, and eat anything in your path—in other words, live like an average teenager!

AAARGH gives you the choice of becoming a monstrous dragon along the lines of Godzilla, or an ogre with one eye and one horn in the best Ray Harryhausen tradition. As either persona, you get to wreak mayhem through twelve scenarios, including a Wild West fort, a Hindu temple and a seaside port.

The object of each level is to find and capture the Roc's egg. While you're searching for the egg, you can have some good-natured fun—flattening buildings, setting things on fire, or fortifying your strength by eating some of the habitants whose knees knock at the very sight of you. (What a monster has to go through these days to get a high-fiber diet!)

The graphics and animation are excellent; the scenes are rendered in three dimensions, and your monster may wander freely in front of or behind objects. Buildings collapse in clouds of dust, while the proper monster-movie music sets a perilous mood.

The humans' only defense consists of a rickety catapult which is easily dispatched. This does not, however, mean free lunch. The same underground nuclear explosion that gave you your charm also created mosquitoes the size of California condors, hornets the size of Cessnas, and pterodactyls that drop surprises in the fashion of large incendiary pigeons. Let your strength drop too far and you meet a messy end.

The game does not offer a "pause" feature, and it needs one. Aside from that, the only

glitch I discovered was the game's tendency to send periodic line-feeds to my printer! Taking the printer off-line solved that problem.

Don't look for a lot of redeeming social value here, but AAARGH is challenging, a lot of fun, and a great way to work off tension. Like they say, after a frustrating commute fighting rush-hour traffic, there's nothing quite like flattening a village of straw huts.

MISSION ELEVATOR

Ask any editor—they'll tell you that most writers' real creativity shows in excuses for why they turn in articles late. My excuse this month: Mission Elevator, marketed in the U.S. by Constellation Software.

In Mission Elevator, you play the part of a secret agent sent to find and disarm a bomb placed on the 62nd floor of a high-rise hotel. A bomb specialist who went in before you was able to discover the code needed to defuse the device, but he was captured. Fortunately, he was able to leave clues hidden throughout the hotel. Your mission—should you plunk down the twenty bucks to accept it—is to find the clues, make it to the top of the hotel, and defuse the bomb. Your opponents include the clock and a small battalion of trenchcoated heavies who would like nothing more than to retire you with extreme prejudice. Nothing to it, right?

The first thing you want to do is find the master key to the section of floors you're on. This key allows you to open any door in that section. That's important because you must find the caretaker in order to make it past the emergency exit into the next section. In the meantime, your explorations bring you in contact with the hotel's guests—a real mixed bag. Unlocking a door yields anyone from a voluptuous blonde to Norman Bates' mother; there is also a profane punker whose language is probably reason enough to keep the game away from the young 'uns.

You travel from floor to floor by elevator, examining everything you see, while dodging the trenchcoats or getting the drop on 'em yourself. From time to time, an enemy agent whispers a clue to you. Sometimes these clues are good, sometimes they are blind alleys, and sometimes they are worse, like when the enemy suggests you check the electrical socket. Right. You won't do that more than once!

While the game is generally well done, it does have some distracting bugs. The package mentions poker games and suggests the ability to bribe agents for information; neither feature is anywhere to be found. From time to time when you examine an object, the game's status box informs you that you have found money, though your score does not change—and you invariably drop the money at the next item you examine! There are several places where you may

gamble up to 600 points on the roll of the dice, but it's no challenge—choosing "two" wins every time!

Mission Elevator is addictive with a very high whoops factor. I almost didn't get this column done because I kept returning to the game, each time thinking that with just a tiny bit more concentration, I'd conquer it. While the problems noted are annoying, they do not ultimately effect gameplay to a great extent. At \$39.95, I'd expect more. At its suggested list price of \$19.95, Mission Elevator is a steal.

AWESOME ARCADE ACTION PACK VOLUME 1

Owww, my hand hurts!! And it's all Arcadia's fault!

Arcadia is the company responsible for packaging three killer games in the appropriately-titled Awesome Arcade

(continued)



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Action Pack Volume 1, marketed by Electronic Arts under the Affiliated Labels program.

When I initially heard about AAAP, my expectations were not high. Frankly, I expected a disk containing three competent but unexciting second-stringers that wouldn't make the grade if packaged separately. I was wrong. Real wrong.

Upon inspecting the package, I was surprised to see not one but three disks—one for each game. Documentation was bound together in one small pamphlet. After a few glances at the docs, I plugged in my Epyx 500X joystick (second to none for action games) and booted one of the disks.

I came up for air three hours later, sidelined by a bad case of joystick cramp in my left hand. Awesome Arcade Action? Yes, indeed.

Xenon is a vertically-scrolling game along the lines of the Atari coin-op, Xevious. It adds a twist, in that you can switch between a ground craft and an airborne fighter at several points in the game. Gameplay takes place in four zones, each divided into four sectors. Like your craft, your opponents' crafts may be either land- or ground-based, and to destroy them, you must select the correct mode. Defenders range from lift cannons on swiveling turrets to armored ladybugs, and they pound your craft with a fusillade of energy weapons. Each hit drains the energy powering your shields; lose your shields, and...well...

Aiding your fight are power pills that appear at strategic places throughout the game. There are several different types of power pill, each with its own effect. One adds lasers to your craft, another adds homing missiles, and still another strengthens your armor. You accumulate armaments as you progress. By the time you're halfway through a sector, you're almost obscenely destructive! About that time, you meet a Sentinel—a large sentient creature with only one vulnerability. Good luck finding it.

Sidewinder, my favorite of the bunch, is also a vertically-scrolling shoot-'em-up. In Sidewinder, you pilot a small craft inside the Star Killer, a massive battlestation along the lines of *Star Wars*' Death Star.

To complete Sidewinder, you must survive five levels, each of which represents a functional area of the Star Killer. You begin the game by invading the battlestation through its waste water vent and immediately proceed to wreak havoc on its water treatment plant. If you thought the Star Killer's inhabitants were nasty before, just wait 'til they find out you backed up their toilets!

From the water treatment plant, you continue through the ship's hydroponics farm, residential area, and flight deck. The final stage is the control level, and features some of the eeriest, unsettling graphics seen yet in a computer game. You see, the Star Killer is actually a...well, I'll let you find out for yourself. Eeeewwww.

Blastaball

"Can you come out ahead to claim the prize, or will you hang your head in shame as you suffer the indignity of a killing?" So read the instructions for the Arcade Action Pack's Blastaball — and it's not what you think. Blastaball is a non-violent sports contest held in the 37th century; sort of like ice hockey on steel! In Blastaball, a "killing" simply refers to going down in defeat.

In Blastaball, you pilot your choice of ten different craft, each with its own flight characteristics. Your object is to square off against another craft (controlled by the computer or another player) and to blast a large steel puck across your opponent's goal. You may propel the puck by firing a blast of energy at it or by direct collision. Play continues for three minutes or until one player scores nine points.

Any of the three games in Arcadia's Awesome Arcade Action Pack would well please the arcade fan; packaged

together, they represent one of the best values for the gaming dollar today. If this is Volume 1, I can hardly wait to see Volume 2!

•AC•

Games Reviewed

JET

SubLOGIC Corporation
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
Suggested price \$49.95
1 or 2 players

F/A-18 INTERCEPTOR

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(800) 245-4525
Suggested price \$49.95
1 player

AAARGH

Suggested price \$34.99
1 player

AWESOME ARCADE ACTION PACK

Volume 1

Suggested price \$49.99
1 or 2 players

Arcadia

711 West 17th Street Unit G9
Costa Mesa, CA 92627
(714) 631-1001

Marketed by Electronic Arts

1820 Gateway Drive
San Mateo, CA 94404
(800) 245-4525

MISSION ELEVATOR

Constellation Software
17 Saint Mary's Court
Brookline, MA 02146
Suggested price \$19.95
1 player

GAMING NEWS

Taito, the Japanese company that kicked off the videogame boom with the classic Space Invaders, has set up shop in Canada and is readying a volley of game titles across a wide range of systems.

Amiga titles set for fall release include: Gladiator, set in ancient Rome; Operation Wolf, a hostage-rescue drama in the jungles of South America; plus arcade titles Qix, Renegade, and Sky Shark. Bubble Bobble, Taito's whimsical game of battling dinosaurs, should be on the shelves by the time you read this.

Arcadia has begun introducing coin-op games based on Amiga 500 motherboards into the video arcades. First titles include AAARGH, Xenon, Sidewinder, Blastaball, and Road Wars; all five titles are available in Amiga home versions.

Rainbird's long awaited Universal Military Simulator was slated for July release along with Carrier Command, its entry into the rapidly-crowding flight simulator aerodrome. Starglider II, followup to Starglider, includes a unique twist—Rainbird is releasing versions for both the Amiga and Atari ST on the same disk.

Discovery Software is preparing its next wave of Amiga releases. Master of the Hypercube sounds like a supercharged version of the coin-op classic, Qix, with players dodging a drifting vector-graphic mesamorph. The title that's really got temperatures rising at Discovery is a D&D-type hack-and-slash being developed under the working title, Sion. In Sion, you control a swordsman on his quest through hazardous forests, graveyards, and castles to rescue the princess. Nothing new so far, right? Well...maybe. Unlike most adventures in which the main character stands about two inches high, Sion's swordsman stands nearly 2/3rds the size of screen! When this guy takes a sword to the gizzard, you'll feel it.

Microdeal U.S.A. hopes to have Tetra Quest, a maze-running adventure, on the shelves by the time you read this. Look for Microdeal's Airball, International Soccer, and Fright Night this fall.

Electronic Arts is being characteristically closed-lipped about the long run, but in the short run, a pair of sequels are planned for August release—Skyfox II: The Cygnus Conflict and Bard's Tale II: The Destiny Knight. I'd better put my moles back to work.

Cinemaware's upcoming TV Sports: Football knocked off a lot of socks at CES. Unlike traditional sports simulations, TV Sports: Football emulates the look of a network NFL broadcast, complete with electronic graphics, cutaways to fans in the stands, and a studio announcer! Put the competition on notice: Cinemaware sets the new standard in sports simulations this October.

DEATH OF A MARAUDER

Discovery Software, the company that elevated software cracking to a fine art with its copying utility, Marauder II, has announced plans to discontinue sales of the program. Given their recent successes in the videogame market, this move was inevitable. "Marauder was not being used for what it was intended," said one straight-faced company rep. "It was a matter of conscience." Now that Discovery has seen the light, they are planning to stage a "hard-hitting anti-piracy campaign." Ah, well. None so zealous as the reformed sinner...the company is currently examining various ways of smoothing the ruffled feathers of current Marauder owners; a discount on the anti-virus vaccinator, VIP, is among the alternatives being discussed.

— Steve Hull

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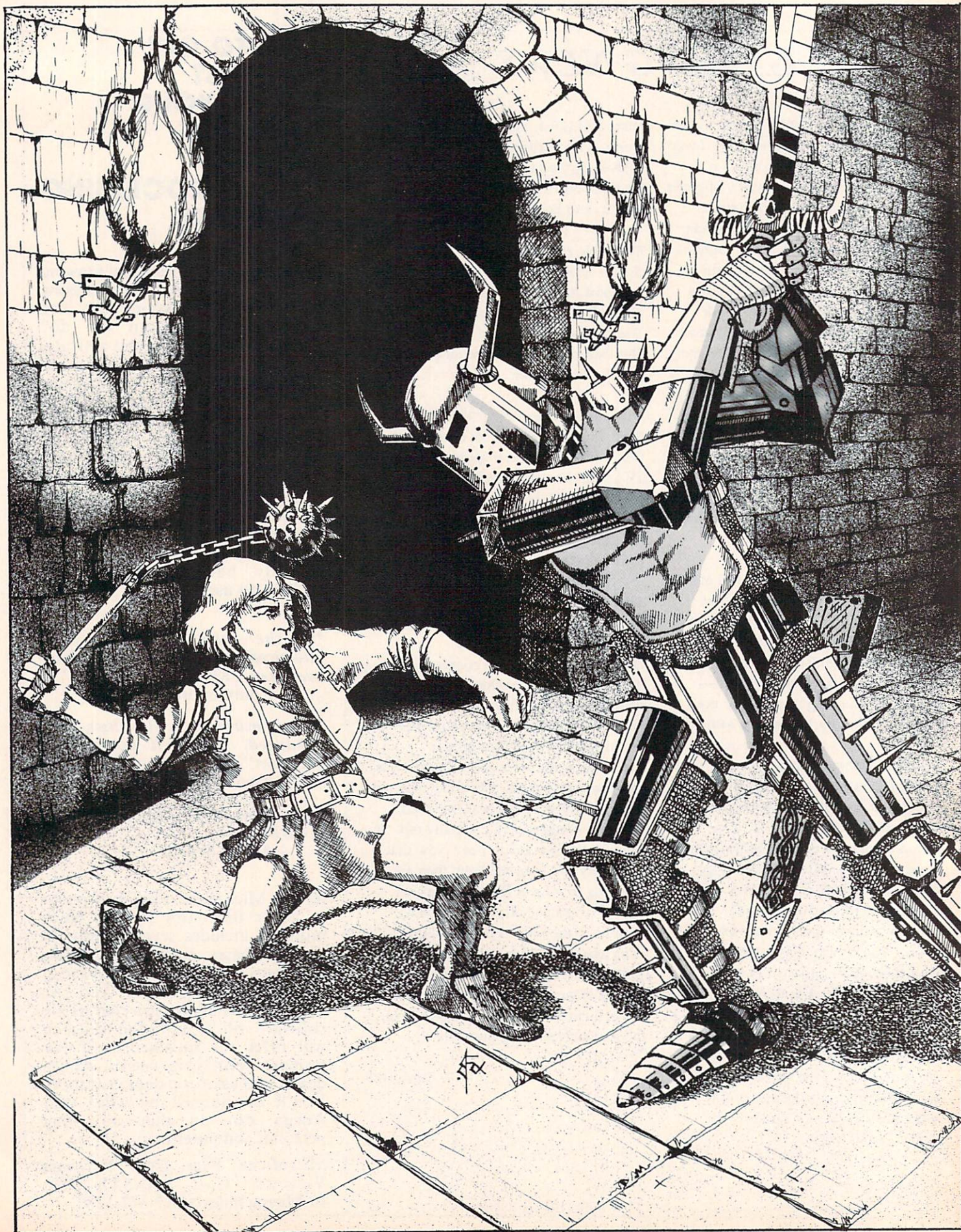
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Dark Castle

Superior digitized sound and graphics... and an enjoyable game, too!

by Keith Conforti

The castle before you looks more ominous than the darkening thunderclouds overhead. You don't really want to go into this dreaded hellhole, but you know your duty. You move on, crossing the rickety drawbridge. You've got to purge that castle of the evil being who resides there—The Black Knight! Mind you, this battle is not for the squeamish.

In the midst of your dark journey, you lock horns with armor clad guards, flying monkeys, burning eyeballs, deadly dragons, disease infested vermin, and many more delightful surprises...

Amiga games ordinarily move into and out of the market limelight at a brisk pace. A game that stays on top for three or four months is a monster success. But those games are rare indeed. After reviewing *Dark Castle*, from Three Sixty Pacific, Inc., I think it too can become a monster success, à la *Defender of the Crown* and *Earl Weaver Baseball*.

Dark Castle is a two-disk game requiring a minimum 512K system on your Amiga and Kickstart version 1.2 or later. On these two disks, you get the ultimate use of graphics, animation, and sound in a top-notch, high quality adventure.

Onward Adventurers

The game's premise is simple: conquer the evil Black Knight. Your heroic skills are thoroughly tested as you venture through fourteen levels of spine tingling battle, with each level more difficult than the preceding one. The battles become furiously paced as you are forced to rely on your quickest reflexes and instincts. It's a real case of slay or be slain.



The Great Hall, your starting point of the adventure.



Just out of reach of the benchman's whip!

(continued on page 24)

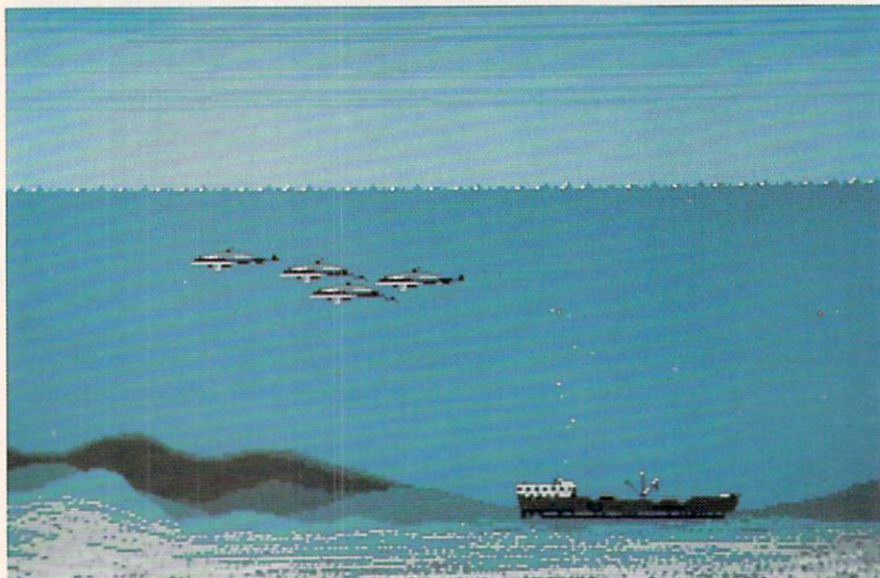
Ports of Call

by Julie Landry

What game involves lots of money, requires a combination of strategy, financial skill, and luck, can last for hours, and takes place in the ocean? No, it's not an underwater Monopoly marathon. It's Ports of Call, a carefully researched, well produced, realistic global shipping simulation that will keep you glued to your Amiga's screen.

Aegis Development describes Ports of Call as "an extremely complex economic and strategic simulation taken from the shipping world." It does take a while to learn how each choice you make influences your shipping company's future. The business can be complicated, and, just as in real life, the subtleties involved in making a successful entrepreneurial venture can take a lifetime to master. You need not be an expert

businessman or seaman to start playing, though. Even the least knowledgeable beginner can acquire at least a rough idea of what's involved from the documentation. From there on, it's lessons in business by trial-and-error.



*Sunken efforts
in a game gone wrong.*

The main idea of this unique simulation is to begin a shipping company, starting with five million dollars. You are the company's owner and captain, and you must use your financial know-how and seafaring talent to rise to the top of the highly competitive world of international trade. If you're good, you'll last a long time; if you're not so good, and you end up owing more money than you're worth, the game ends and the humiliating profit/loss statistics are displayed for all the world to see.

Up to four can play. If you're alone, you can pit two shipping companies of your own against each other and experiment with

different strategies. Or, you can simply operate one company until you run out of time, decide to quit, go bankrupt, or collapse from exhaustion and hunger. Yes, Ports of Call is addictive, and if you're in the middle of a winning streak or in the depths of a financial slump, choosing the option to save your position in the game seems like a great sacrifice.

You can set the game to last for one, two, or three hours, or until everyone goes bankrupt, in which case the winner is the player whose shipping company survives the longest. If you decide to set a time limit—a wise choice, if several people are playing—the winner is determined by the number of status points each company earns.

Next, each player must choose a home port from a list of 28 cities. Although some ports are more expensive to operate from than others, taxes and other related expenses are deducted from your bank account periodically without notification. If you find your home port is draining your profits, you are free to change, but only at the cost of about a cool million.

Once you're ready to begin, you are presented with the World Simulation Display screen. One portion of the screen shows a map of the world, with storm systems and everyone's ships clearly marked. Another section shows time elapsed, and boxes allow you to click to visit the Office, go to the Ship Broker, or examine your route on the Globe. You can also click on a start/stop action gadget if you need to take a break.

The first place you visit will probably be the Ship Broker. You probably won't be able to afford a brand new ship at first, but there are used ships in fairly good condition. For about a million, you can get an old ship and fix it up. Later, if you want to sell any of your ships back or pick up a few new ones, you can return to the Ship Broker. Ship prices fluctuate, so if you plan to sell an old ship, you may want to wait until a better price is offered. Don't expect any gifts, though.

You can go to the office to pay debts, obtain credit, or simply examine your financial records and check your status score. Each office is designed differently, and one of the offices even has an Amiga in it. The graphics here are especially impressive, and the graphic designers—R.E. LaBarre and J.D. Sachs—deserve much praise.

Clicking on the Globe shows your ship's current position and the route it follows to its destination. You can also click gadgets to rotate the globe for a better view. This option is useful to compare your ship's route with the World Simulation Display, which shows the shifting storm systems. If you get caught in a storm, you must either detour—that could cost you several days—or just go through it and hope your ship doesn't take any more damage than you can afford to repair.

Players then take turns arranging cargo and destinations. When it's time for something to happen on one of your ships, a screen comes up showing the interior of the ship, including a porthole

that lets you view the harbor. This artwork is another nice touch, and no two ports look alike.

From here, you can arrange to repair or refuel your ship (unless you can't afford it!), or you can find out what kind of cargo is available. Depending on where you are, the cargo can be anything from expensive arms to worthless ballast. You also see a list of cities where you can peddle your goods. If you're lucky, you'll get a good deal. If you're not so lucky, you may have to lay up ship for a few days until things get better. However, this can get expensive after a while, and the offerings can actually grow worse with time. If things don't improve, you may have to settle for less, or maybe even make a trip to another port with nothing but ballast in the hold.

Occasionally, an anonymous smuggler may ask you to make a "strictly confidential collateral agreement." If your shipping business isn't doing very well

and you really need the extra money, chances are you won't be able to pay the steep fine if the customs people catch you. The idea of making money on the side is quite tempting, however, and it's another one of those realistic touches in this game. Just remember that getting caught could affect your company's status!

Once you've loaded your cargo, you must maneuver the ship away from the dock. If you're lazy and have a lot of money, you can hire a tugboat to do this for you. Don't count on a tugboat every time, though, because a strike is highly possible. Either way, you'll eventually have to learn how to steer your boat. It pays to learn fast, because it's easy to make a mistake, crash, and take damage.

Next, you must decide on the optimum travelling speed. If you're low on fuel and even lower on funds, you'll have to

(continued)

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slow down to avoid getting stranded. (There's a considerable penalty for running out of fuel!) Otherwise, it's best to move quickly so you can outspeed your competition. Also, you must consider daily operating costs, plus the possibility of arriving late if you're working against a deadline.

Out in the ocean, you'll have to worry about stormy weather, boats on a collision course, icebergs, reefs, and shoals you have to avoid. This is why you have to learn how to maneuver your ships. If you don't, you'll either go bankrupt repairing them, or spend a lot of time watching the animated sinking-ship scene.

Other disasters present you with no choice. If you get bombed in a war zone, there isn't much you can do about it. You also have no defense against pirates who steal your cargo. Quarantines and rat infestations are bad for your status, as well as your bank account. And if you really mess up and smash the life raft of a helpless shipwreck victim, your reputation suffers.

These seafaring adventures are only the ones I've encountered so far. Every time I thought I'd seen it all, another unexpected disaster took place. If Rolf-Dieter Klein and Martin Ulrich discovered anything in their research of marining mishaps that they didn't include in this game, it's probably just as well. Sometimes a little realism goes a long way!

When you arrive at your destination, you must dock your ship. If exiting a port is difficult at first, entering one is a nightmare. Each port is designed differently. Some are roomy and easy to move around in. Others are narrow with odd angles and inconveniently located docking areas. To make things still more difficult (or challenging, if you want to look at it positively), you can't see the port until *after* you decide whether to use tugboats or steer by hand. And, worst of all, the ports seem to change from one game to the next. If London's harbor is easy to move around in during

one game, it may look like a confusing maze next time you play. You just have to take your chances.

As your fortune increases and you build your fleet, your status improves. In general, the bigger, more successful companies that service more ports and have more expensive ships enjoy better status than those with rusty, rat-infested ships and irresponsible captains. Of course, there's more to it than just money. A captain who always responds to SOS calls, never has trouble with customs, and always gets the freight delivered on time has an advantage over a captain who keeps running out of fuel at sea because the company can afford to pay the towing penalty.

Ports of Call is challenging, educational, and complex. You can test your knowledge of international shipping, gaining along the way a familiarity with the problems and triumphs of sea captains and world trade. The game is very realistic, thoroughly researched, and richly detailed.

The graphics are top quality. Some especially impressive scenes include the view from the porthole in the ship's cabin and the office screens. The animated sinking ship is a miniature masterpiece (unless it's your ship that's sinking), and even the bricks on the ship broker's building look as if they were individually copied from a real brick wall.

There are also sound effects that simulate the sound of ocean waves, SOS signals, and a ship's engines. They are all realistic and add another dimension of authenticity.

Of course, perfection isn't much without a few minor faults for contrast. First, Ports of Call's opening sequence is quite long, and you can't speed through it. After reading the credits and admiring the pictures of the game's authors for the zillionth time, and then viewing the animated title screen, I began to wish there was some way of skipping to the game right away. Conversely, if you're

willing to spend three hours on this game, what's an extra minute or two? It is an inconvenience, but a minor one.

One or two of the message windows contain small spelling errors. This surprised me a little, but it didn't spoil the game. I was also slightly disappointed by the documentation, which was skimpy in a few places. However, it's no fun to read a long manual before you can even start the game up. Most of your questions eventually resolve themselves as you become a more experienced sea captain.

There are three levels of difficulty, but the only thing that really separates Beginner level from Genius level is the number of disasters encountered at sea. Of course, the increased element of chance does present more of a challenge, but the difference seems to be based mainly on bad luck. If the beginning level were simpler in the first place, with fewer choices influencing the outcome of the game, there would be less to overwhelm beginners. True, some of the game's realism would need to be compromised, but the easiest level is *supposed* to be less complex than the others.

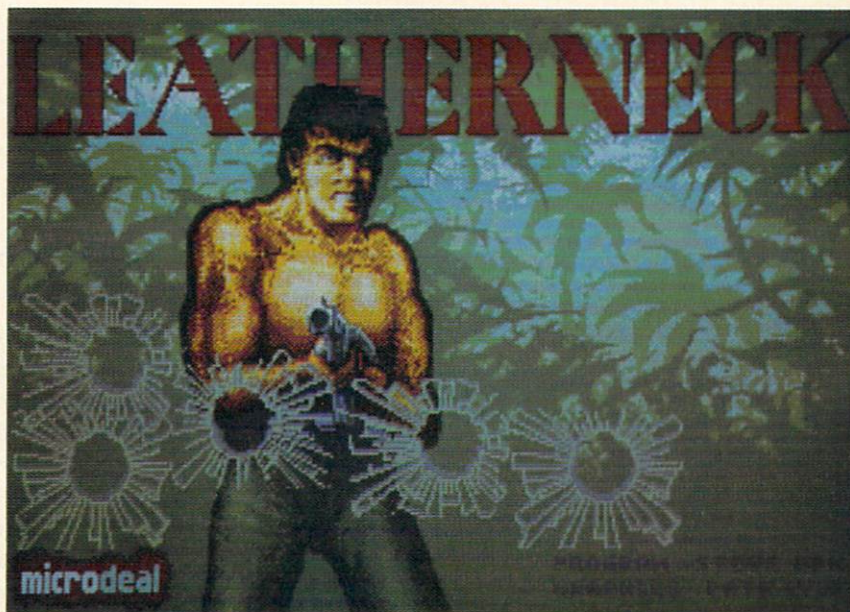
Ports of Call is a very slow game, due mainly to the amount of time spent maneuvering ships, either within ports or through reefs, icebergs, collision courses, and so on. It's not a problem that can be avoided, but it seems as if more than half your time is spent on navigation. Considering the emphasis this game places on strategy, it seems strange to have to double the playing time like this. But it also doubles the challenge.

As you play, you'll either be pleased with your own skill or frustrated by the unlucky breaks that seem to spoil all your apparently brilliant moves. It won't necessarily be smooth sailing all the way, but it will be entertaining.

•AC•

Ports of Call
Aegis Development, Inc.
\$49.95

You're a Commando Warrior blasting your way through the jungles of the Evil Empire. *Sound familiar?* Well, Leatherneck's theme does resemble that celluloid classic, Rambo. Microdeal's Leatherneck is a scrolling, arcade-style shoot 'em up with America's finest going against the sinister denizens the Evil Empire. And Leatherneck is good, mindless fun.



by Mike Creeden

As the game progresses, the enemy advances faster and in greater numbers. Pick off as many as you can. And there's bonus for you Rambo fans—the dying soldiers let out a scream that would do the old mumblin' musclehead proud. But be careful not to get too close to the enemy because they're obviously well trained in hand-to-hand combat.

Your Leatherneck is armed with heavy and light machine guns and a bag of hand grenades. Your enemy—as plentiful as the skeeters in the Empire's jungles—are armed with machine guns, grenades, cannons, and pillboxes (grenade launchers). Your strategy: blast'em.

On the Frontlines

As the game begins, move forward immediately, because after a few seconds, the program kills off any men who aren't moving. (Besides, you're not yellow, are ya?) The good people of the Evil Empire don't like intruders, so they'll be right down to check your visa. That's when the fun begins.

The status and score window in the right quarter of the screen displays your remaining ammunition, lives (you get three), and the weapon you are using. At the start of the game, you're equipped with the heavy machine gun.

Change weapons in one of two ways: by keyboard stroke or by a quick right-left-right joystick movement. The joystick movement keeps all movements together, but it's also dangerous: you just might send your little Rambo right into the line of enemy fire.

Your Arsenal

The heavy machine gun is best for longer range shooting, but firing is rather slow. The light machine gun provides short range, rapid firing—good for mowing down onrushing lines of foes.

Your most powerful and versatile weapon is the hand grenade. With the grenade, you can blow up handfuls of Evil Empirians with a single shot. The grenades are the only weapons you can use if you're hiding behind a hut, rock, or barbed wire fence. Finally, grenades are your only weapons against the cannons and the pillbox—that grenade-launching beast that looks like a Little League pitching machine. For highest score, those are just the things you want to hit.

Grenade power notwithstanding, you'll want to switch weapons occasionally because ammo is evenly distributed between the three. Keep an eye on the bullet in the status window, when the bullet gets short, switch weapons to get a full supply of ammo.

If you really get low on ammo, the Evil Empire has been nice enough to leave its ammunition in plain view; just walk over it and fill 'er up.

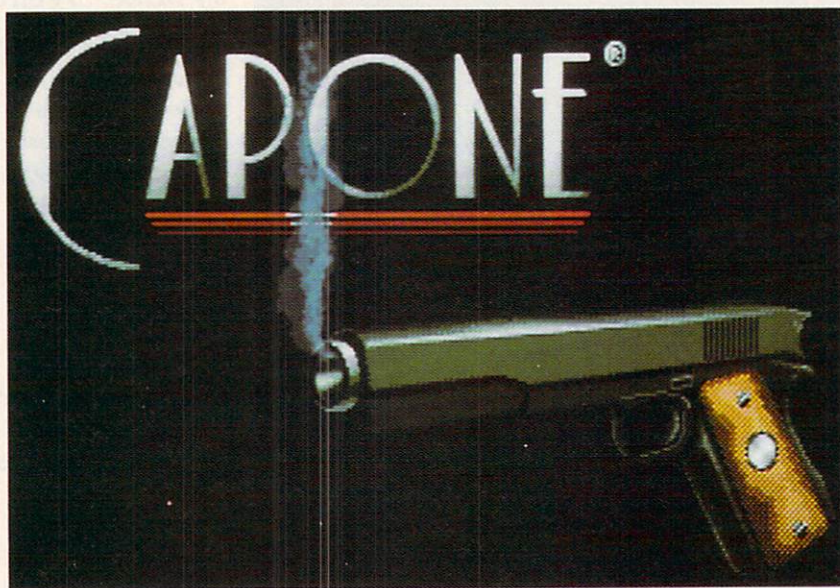
For highest score, though, it's best to concentrate on the cannon and the pillboxes. But remember, your grenades are your only weapons that can take them out.

When you get tired of playing Rambo, sole defender of the American way, maybe you'll want to join a platoon—Leatherneck allows up to four players. Joysticks for the first two players plug into your Amiga gameports; to play three or four player Leatherneck, you need Microdeal's adapter. The adapter allows you to attach two more joysticks to the Amiga's parallel port.

It wouldn't be jungle warfare without a few bugs, though. The joystick movement for changing weapons is difficult to execute and often left me dead in my tracks. This left me with the keystroke method, an awkward move that left me wide open to enemy fire.

Despite its simple premise and playability problems, Leatherneck is challenging and a lot of fun. Besides, if old Sly made umpteen billions from the Rambo flicks, don't you think Leatherneck should get Microdeal at least \$39.95?

•AC•



CAPONE, THE GAME

by Joyce Hicks & Robby Hicks

Capone has two styles of play. Normally, the game performs on your existing Amiga system using your mouse to aim and shoot. With a new twist, Actionware has programmed Capone to use the Sega light gun (\$49.95). And to make the game more exciting, a dual gun interface (\$39.95) is also available to allow two players to simultaneously fire separate light guns.

Al Capone, born January 17, 1899, became perhaps the world's best known gangster. Known as Scarface, Capone dominated crime in the Chicago area from 1925 until 1931. At age twenty-six, he managed in excess of one thousand "employees" from whom he demanded absolute loyalty. After years of evading the police and federal investigators, Scarface was finally apprehended and sentenced for the only crime the law enforcement could clearly connect him to—tax evasion. Capone died from an incurable disease at his Miami Beach mansion in 1947.

Capone was no man to idolize. His nickname, Scarface, was the result of a knife attack by the brother of a girl he insulted. His life and business depended on his cruel justice and ruthlessness. He whipped his men into a band of brutal, vicious characters who spawned the term "gangster."

Capone, distributed by Actionware, lives up to the Capone legend. It is billed as a "new style action adventure that requires the agility and marksmanship of an action arcade game, but also gives the atmosphere of an adventure." Capone does not disappoint.



The game complete with dual light guns.

As Capone loads, the player is presented with several options. The player must choose either Mouse or Gun, tell the program which Amiga model is being used, decide between one or two players, and choose the level: Cadet, Rookie, or Captain. Cadet is the choice for beginners, but each level of Cadet play becomes faster with more hazards. Eventually Cadet level reaches the same conditions as the Captain option—which, incidentally, is "not recommended for pregnant women, children less than 42 inches tall, or those with a weak heart."

You are an undercover cop in Chicago, circa 1920. You are running to catch a bus when a window shatters across the street. You decide to get in a parked car and return fire. You realize that Capone's mob is out in full force and you must shoot down all Capone's gang to get to Capone himself. You begin the game with three lives, symbolized by guns on the bottom of the screen.

The first scene is a fairly quiet street. Figures slowly appear in the building's windows. Shooting quickly is important, both for added points and to keep the gang from firing at you. Be aware of innocent people who appear in the windows from time to time. Shooting a bystander costs you one life, while failure to shoot the bad guys quickly enough affects your health line and can also cost you a life. If you are shot, quickly disposing of mobsters can build up your health again.

Your first reaction is to fire as quickly as possible at all targets. However, your ammunition is supplied at a steady rate and it is easy to run out of ammo. With an empty gun in your hand, you stand and wait for new bullets to appear at the bottom of the screen and pray Capone's men don't start shooting first!

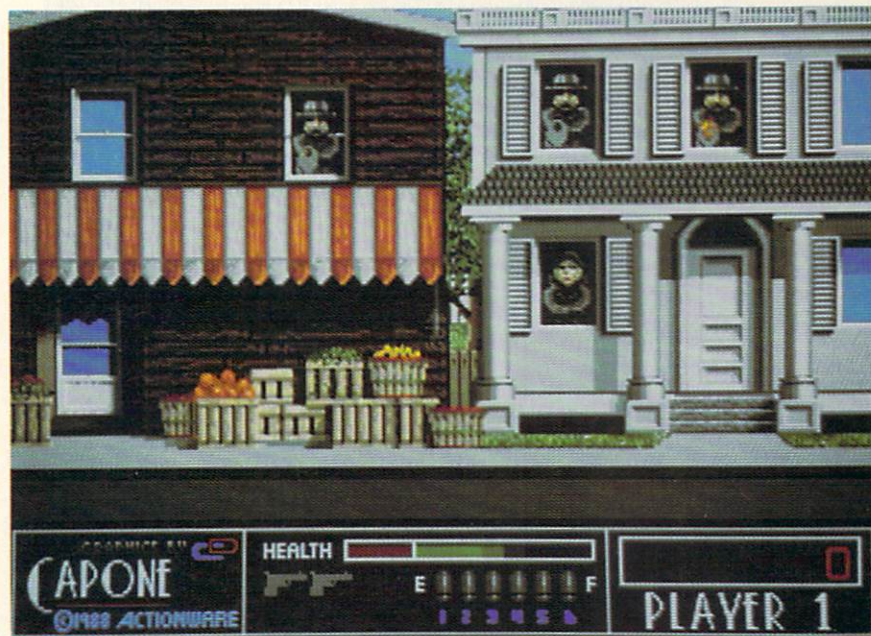
As the gangsters fall before your spray of bullets in the first buildings, you slowly move down the street. New buildings appear, containing more mobsters; walking gangsters also come onto the scene. A machine gun appears on the sidewalk from time to time, and if you shoot it, your pistol becomes a machine gun for a while (helpful in later levels as the action becomes more hectic).

If you finish off enough gang members in each scene, you progress to the next adventure. As you progress through each adventure, you are awarded an extra life. You are limited, though, to six lives at one time.

Play becomes more intense as you reach different areas. The walking mobsters drop dynamite sticks when they are shot; these must be destroyed by a second shot. The gangsters pop up in the windows more quickly, with more appearing at one time. Pedestrians also become hazards as you try to maneuver your shots around women, dogs, cats and kids on skateboards. Hitting anyone of them costs you points, but not a life.

The middle of your trek provides a "break" in the action in the form of a warehouse. Capone's men have taken

refuge in the dark building filled with TNT crates. Here there are only gangsters, no innocents, which pop up from behind the crates. The object is to shoot the men without blowing up the TNT. The machine gun is a no-no in this section. If you hit the TNT, it affects your health line, but not necessarily your life (as long as you keep shooting through the smoke).



A couple of scenes depicting the intense quick draw action of Capone.

Although the game can be used with the mouse, the light gun is much more fun and realistic. We all agree that the mouse is much too difficult to use as the game moves along and the pace quickens. The gun is really worth the extra investment, and Actionware promises two more games which will also use this gun. We made the most progress in the game with

(continued on page 26)

Casino Fever

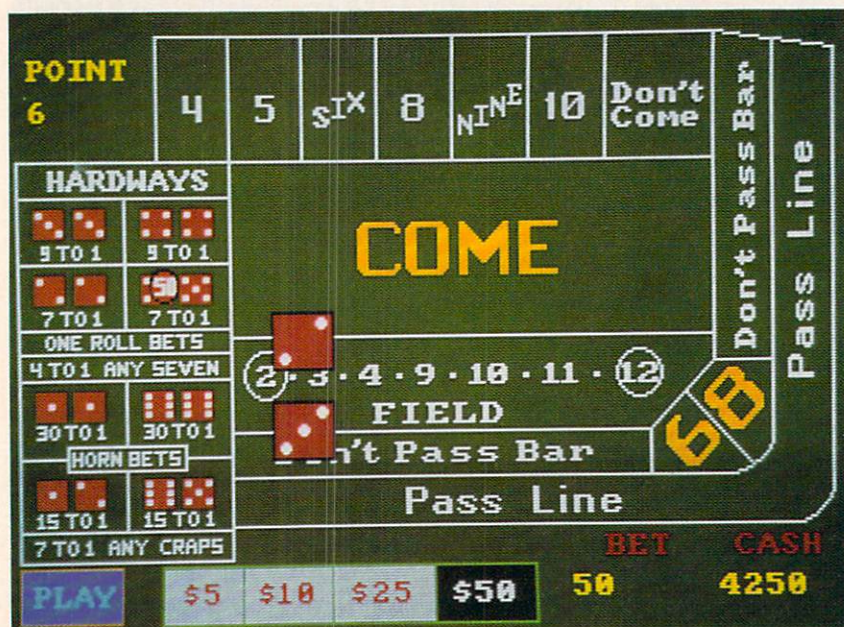
by Michael T. Cabral

"Place your bets... All bets down... No more bets."

Around an elbow-to-elbow roulette table, this less-than-catchy cadence cracks the air once per minute. The bland voice of the bow-tied guy running the show reveals his boredom. To him, spinning the roulette wheel is like pumping gas. Thirty-five hours a week equals a decent paycheck. Yawn.



Casino Fever brings roulette realism to your Amiga.



The complexity of craps is nicely simplified.

But the flipside that keeps Vegas and Atlantic City hopping is only a table-width away. Rubbery chips slide from sweaty hands to velvety green tabletop. The chips are really singles, tens, fiftys, and hundreds, but they are cleverly designed to look nothing like the cash they represent. It just doesn't seem like you're losing a hundred bucks when the chips look like Necco wafers.

Tension-wrinkled faces hypnotically follow the bounding, spinning white ball. Some gamblers, unable to look fate in the eye, check out their shoetops as the wheel slows. Others crane over the wheel, determined to somehow intimidate the ball. The unfazed ball nestles into a single slot on the wheel. Groans and sighs explode, then hush as the cadence again takes over. The atmosphere is strange, but truly wonderful.

If you are wondering whether or not this world is for you, just boot a casino simulation, haul your fictional bankroll to the table, and wager away. Sure the atmosphere won't be quite the same, but a well done simulation teaches you the trade while showing you a genuine good time.

Casino Fever by Ethos Development is the latest shooter to beat the odds and step into the ranks of successful casino simulations. The program joins a healthy dose of realism with snappy graphics and on-line documentation to grab a spot as a sharp gambling tutorial and a lesson in how to have a great time losing your fortune.

After a serene, almost seductive musical opening, the choice of four hard core casino games gets things off on the right foot. With poker, craps, blackjack, and roulette at your disposal, you're never at a loss for some good ole' fashioned, sweaty palmed gambling anxiety. Each game has its advantages and apt comparisons to the real things in Vegas, so let's stroll from table to table.

How 'bout An Inside Straight?

The version of five-card draw closely resembles the one played on the video poker machines in Vegas. Your wins or losses are determined by standard odds payoffs. Three of a kind always pays the same amount, a full house always pays the same, and so on down the line.

The differences between the Vegas machines and Casino Fever are subtle, but worth noting. Fever's poker payoffs are much more generous. Anything below a pair of jacks means lost cash in Vegas; Casino Fever returns your bet for *any pair*, from deuces to aces. This generosity allows you to keep your head above water with measly pairs. In Vegas, there's real cash on the line and pairs only send you to the poor house. The payoff ratios also differ. Vegas is a case of the more you bet, the more you get; Fever pays off at the same odds whether you bet a one dollar or a thousand.

Overall, the poker here is close enough so you know what to expect from the endless rows of poker machines in Vegas. Money management is a problem because of payoff discrepancies, but play is realistic and fun. The only difference worth beefing about involves discarding. In Vegas, if you accidentally click on a card you don't want to chuck, you can just as easily toggle back so the card is one of your keepers. Casino Fever has no undo or toggle, so once you click a card, it's gone for good.

Gimme A Hit

Blackjack tables are the most crowded attractions in Vegas and Atlantic City. The game is simple to play and the odds aren't all that bad, so almost anybody will take a shot at that twenty-one.

Casino Fever blackjack runs true blue to Vegas. Gadgets allow you to split pairs, double your bet on a hot hand, and even insure yourself if the dealer has got an ace showing. The dealer always takes a tender hit on sixteen and stands pat on seventeen. A menu option allows you to choose from up to the six decks Vegas tables use to foil card counters. The only thing missing from Casino Fever is the

pit boss in a pin-striped suit watching the dealer's every move!

If you want a quick blackjack tutorial without a lot of overblown strategy, you've come to the right place. Fever covers the blackjack basics that can keep you sitting at a Vegas table as long as your funds hold out. A more involved tutorial might include strategic tips and odds playing advice, but simplicity is the key at the Casino Fever table.

Watch the Bouncing Ball

Despite all the dizzying bets on the table, roulette really comes down to the luck of the bounce. You would think roulette is a game exclusive to gambling gurus. Casino Fever taught me that roulette is a game for everyone.

Roulette really brings out Casino Fever's talent as a tutorial. On-line help concisely explains all bets and payoffs. I entered the game with zero knowledge of roulette, but two weeks later, I confidently grabbed a spot at an Atlantic City table. The explanations are short, sweet, and simple; and the visual display of the table gives the help screen a friendly, hands-on feel.

Casino Fever roulette also takes realism to the hilt. All payoffs are identical to the real things. The graphics are superb; the table is a sharply scaled miniature of the real McCoy. When I stepped up to the table in Atlantic City, I was shocked by how closely it resembled what I'd seen on my Amiga screen just a day earlier.

Next Shooter

If roulette is deceiving in its complex appearance, craps takes the other half of the cake. Craps looks complicated, and the game certainly fits the look. In Vegas and Atlantic City, four table attendants and a pit boss man each craps table. With real cash on the line, craps is not for the uninitiated.

If you're willing to invest your time before you invest your wealth, Fever has



the tools to shape you into a savvy craps shooter. The program's strength as a tutorial blasts through in full force. Hardways, pass line bets, come out rolls, and other imaginables are explained. On-line help screens are here in bulk.

The quality and depth of the craps tutorial would certainly be enough for me to deem this portion of the program great. But you get much more than just a dry lesson. The miniature table's graphics outshine even those of the roulette wheel and table. Two oversized dice tumble from the right side of the screen with realistic sight and sound.

When the Cash Is Gone...

...it's time to leave the glimmering casino behind. Overall, Casino Fever is a super simulation, low on flaws and high on realism and teaching power.

The developers of Casino Fever tread well the fine line between simplicity and a little bit of expansion. Well known, easy to play games like poker and blackjack don't need much backup documentation. Roulette and craps, games quite a few notches up on the complexity scale, need outlined expansion and get it in nice form from Casino Fever. If you're planning a pilgrimage to the real casinos, pick up Casino Fever. And remember, no gambler can pass up a sure thing like this.

•AC•

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(Dark Castle, continued from page 15)

Your only weapons are stones which are abundant throughout the catacombs of the castle. Occasionally, you may acquire a mace, fireballs, or a magic shield to aid in your endeavors, but unfortunately, these items are only temporary.

As you play *Dark Castle* more and more, you can establish a routine for conquering many of the lower levels. Not that it becomes monotonous; the challenge is much more than you and your stones can handle. It's a good thing your fierce little warrior has five lives because they are quickly drained as you take on the likes of Merlin the Magician and the fire-breathing dragon. You must react like lightning here, but you must plan your moves carefully if you want to elude your enemies.

Staying alive is no easy task, but if you conquer all fourteen levels, don't pat yourself on the back yet. You still must destroy the Black Knight in a tremendous showdown that is too violent and chilling to describe on these pages!

Creepy Crawlies & Nasty Vermin!

On your venture, you are bound to run across some strange and lethal creatures. Most common of all is the constant onslaught of bats and rats. Both are infested with life threatening diseases, so try to avoid their bites. You must stone them, or they follow you relentlessly.

Other beasts to keep an eye on include kamikazee vultures, obnoxious mutants (they make this twitty little high-pitched "neh, neh-neh-neh, neh" sound), magic brooms, (yes, brooms), whip and rock henchmen, and the menacing burning eye. Each of these can be eliminated by a bash with one of your trusty rocks or by wielding a blow with a mace you find at the battle scene.

Running through the various chambers may remind you of other arcade games. Similarities to *Donkey Kong*, *Mario Bros.*, and *Space Invaders* are all found here.

Use the keyboard to control your brave little warrior. Once you learn the proper

keystrokes, you should be deftly maneuvering him all around the screen. Your character has the ability to walk, jump, duck, and perform specified actions at particular times. With the mouse, you can swing his arm to sling the stones or swing the mauling mace.

Some Notes on Sound

Dark Castle will long be remembered for its innovative and fantastic use of digitized sound. I knew I was in for a treat when the title screen appeared proudly boasting the "in stereo" symbol that has become the latest trend of network television.

In *Dark Castle*, there is a stereo sound for everything, and I mean everything! You cannot even click the mouse without hearing something. The bats and rats squeak; the vultures squawk and dive. Listen behind you and you'll hear doors creak and the patter of your own rushing feet. Throw a stone, and your character grunts with each fling. Avoid falling or walking into something. If you do slip up, be prepared to stumble dizzily about, moaning, as you try to regain your senses.

No sound, no matter how insignificant, is overlooked in *Dark Castle*. And some of the them really enhance the action, such as the vicious crack of the henchman's whip and the thunderous rolling of bone crushing boulders.

Comments and Queries

Overall, *Dark Castle* is a superb arcade game, definitely one of the most entertaining yet for the Amiga. Though the game is a bit short on plot and strategy, it is still a lot of fun, especially for game junkies who love to test their raw instincts and lightning reflexes. The game is a slick combination of state of the art graphics, dazzling digitized sound, and just plain fun. And when a game can pull off this combination, you know you've got a winner.

•AC•

Dark Castle

by Three Sixty Pacific, Inc.

2105 South Bascom Avenue Suite 290
Campbell, CA 95008

Game Pizazz

A series of articles on game hints and tips.

by Jeffrey Scott Hall

Hello and welcome to a series of articles on game hints and tips. You might be wondering why the series is called "Game PIZAZZ." Every Amiga game does indeed have its own "spark," but the main reason for the name is that I'm writing about only the hottest and coolest games to keep you glued to your Amiga. I'm here to listen to your input about the most difficult gaming problems. This time, I made up phony questions to get things started. However, in the future, I need your game questions. You can reach me through *Amazing Computing*, or you can phone the BBS that I SYSOP. So, dust off your games, get out that joystick, and blast'em!

Q. When playing **Obliterator**, I cannot shoot aliens hanging from the ceiling. I tried the blaster, bazooka, etc., and nothing works. What type of weapon should I use?

A. You are having difficulty hitting the alien because you are not using the proper weapon. To hit the aliens on the ceiling, you must use the pistol you have when you start the game. The other weapons are good for battling aliens and robots on the ground, but your pistol has a higher range for some reason. Warning! This strategy does not always work when you encounter tougher aliens and robots. The only way to get past them is to do a running-defend which causes Drak to do a ground somersault and let you pass by safely.

Q. When playing **Test Drive**, how can I keep the fuzz from stopping me when I drive over the speed limit?

A. Get your speed up to or above 110 mph and nothing can stop you. You're just a blur on police radar and they're engines are no match for yours.

Q. I have trouble when I reach the higher levels of **Capone**. My friend and I use two light PHASER guns and the Dual Gun Interface, but we still can't go beyond the warehouse. Can you suggest something?

A. When I first got the game, I had the same trouble you are having now. Finally, I figured out what was going wrong. When you and a friend use the Dual Gun Interface, take advantage of it. Have your friend take one side of the street while you take the other. For buildings, one person can take the top while the other person takes the bottom. Even though your score is lower, you can complete more of the game. Also, if your partner runs out of ammo, you can cover him until he's re-loaded, and he can return the favor when you run dry.

Q. I was playing **Vampire's Empire** when I found myself in another level. However, I can't seem to figure out how to get out of it. It keeps going in circles. Help!

A. Your problem lies in the level you are on—you have either not collected an artifact or activated a secret passage door on that level. You must collect all objects on that level, then wander around for a while. If you are going in circles, try touching a wall, falling through a trap door, and getting rid of nasties. Repeat all the above, even if you go in circles. Sooner or later, you find yourself in a brand new spooky level.

Q. While playing **Firepower**, I accidentally blew up one of my own bunkers when green men (the enemy) started running out. Can I shoot at them and run them over? Or are they my own, even though they are green?

A. If the men are green, run them over, blast them, or do whatever you please. You will not only find enemies in enemy bunkers, but also as prisoners in your bunkers. To obtain a higher score, blow up your own bunkers and watch the enemy run for cover. You can have an absolute field day running them over with your tank. However, along with the good must come the bad. Too much of this work against your own bunkers causes your home friends to turn on you and open fire. So be careful; blow up the enemies in your territory only a few at a time.

(continued)

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Q. I cannot make it past the guard inside the temple of Dosnebian Clerics in **Phantasie I**. I have tried just about everything and have most of my party at level fifteen and above. Can you help?

A. It took me forever to figure this one out. The secret lies with the Clerics themselves; they are prejudiced to your party. If you do not have a Minotaur in your group of adventurers, you can not get past the guard. Drop one of your members that you can live without for awhile (not a priest or wizard) and add a Minotaur. He does not have to be skilled; you just need him to get past the Dosnebian Clerics. Once you get past them, the fun begins!

That's a wrap. Remember game fanatics, this is your forum. Let's hear all your game hints, tips, gripes, and whatever. So, until next time, keep those questions coming and happy gaming!

Zap your game questions to:

Jeffery S. Hall
c/o *Amazing Computing*
P. O. Box 869
Fall River, MA 02722

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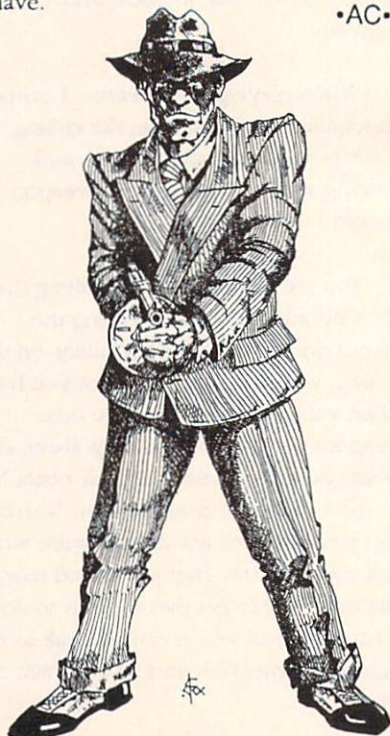
Capone, continued from page 21

the two player, two gun system. Using this method, each player only needs to concentrate on one half of the screen at a time. We were able to get all the way to the front of the bank. (Sorry, we haven't seen the inside yet.)

The game also has a unique feature we enjoyed. When you run out of lives, you are given an eight-second chance to press the trigger and receive a free practice session. Although you start with zero points, you have a chance to work on the section in which you were stopped and possibly go on to a new section. This way you don't have to start at the beginning every time and plow through the slower, already mastered sections.

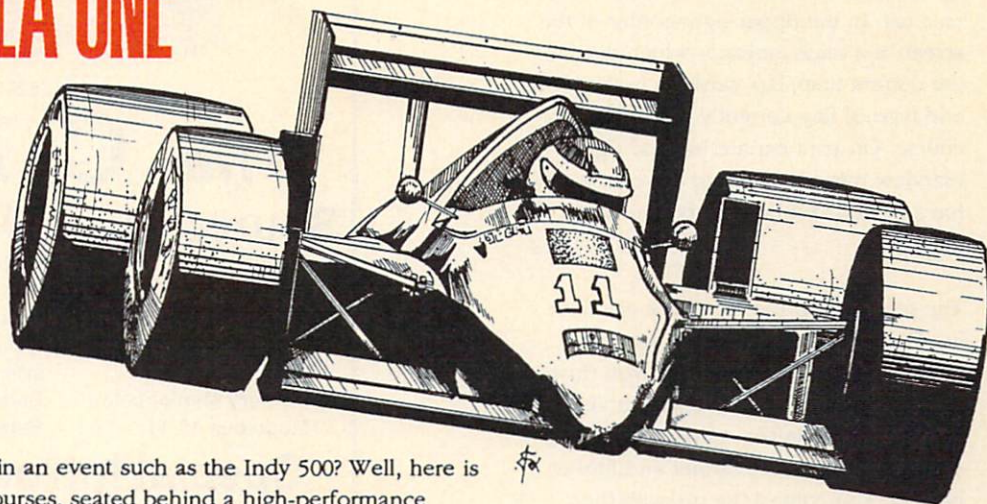
Capone makes great use of the Amiga's graphics; they are colorful, interesting and flawless. In addition, the game has been in almost constant use since we received it, and we have not seen any flickering or breaks in any of the scenes, nor have we experienced any freeze ups. Capone is liked by all age groups, from my ten-year-old son to my sixty-year-old father (who, by the way, has the top eight scores). We hope you and your family enjoy Capone as much as we have.

•AC•



•AC•

FERRARI FORMULA ONE



reviewed by Jeffery Scott Hall

Have you ever wanted a chance to race in an event such as the Indy 500? Well, here is your chance to race several distinctive courses, seated behind a high-performance Ferrari Formula One racing car! Moments after inserting your disk, you are shown a title sequence while music plays in the background. To abort this sequence, press the joystick firebutton, and the game finishes loading. Next comes a difficult choice: which race course to drive.

Choosing a Race Course

The transport truck takes you to the race track of your choice, and the time it takes to get there is deducted from the clock. What exactly does a clock have to do with high performance racing? Well, this is the Big Time, so you book yourself for certain races at different times. If you cannot get there by truck, never fear. Your very own plane can fly you to your destination. (Now that's service!) To make a selection, simply click the left mouse button on one of the dots located on the world map display. You can choose from sixteen different race courses, and each one is unique, offering a greater challenge. Once you have arrived at your destination, you are in the garage near the race track.



In the driver's seat of a Ferrari Formula One.

Looking at the Garage

Inside the garage are all the standard accessories, such as an engine crane, fuel, parts, and even a mentor (named Mauro) who advises you. To use an item, simply click the left mouse button on the object. For example, if you want to refuel, click on the gas can and move it to the fuel intake system. Other features allow you to change engine parts, put on new or different tires, and even experiment with fuel additives. While in the garage, you can also save the current game, load an old game, or save the current stats to disk. (Make sure you insert a blank disk, not the master.) Everything you possibly need for racing is in this garage. However, you must remember—while you are there, time is ticking away at the race track!

(continued)

Sitting in the Driver's Seat

Now that you have the car ready for the track, let's go out and see how well you race! Your perspective is from behind the wheel of an actual Ferrari Formula One race car. In the upper right corner of the screen is a track indicator which displays the current time, lap, position in the race, and type of flag currently up on the race course. On your car are left and right rearview mirrors, showing the cars you have passed and how far behind you they are.

The graphics for the race track are done in 3D, giving you the feel of actually driving on the race course. As you drive along, you can almost feel the curves, see the people in the stands, and watch your competition fall farther and farther behind. You control the car with the mouse; you accelerate by pressing the left mouse button. Shifting is done automatically, but if you aren't careful to slow down for curves, disaster will inevitably strike.

To win, you must complete the race course before time runs out. This task is difficult, especially if you have an accident and need a pit stop. If you are fortunate enough to win the race, you are prompted to enter your name in the high scores list.

Summary

Ferrari Formula One combines good graphics and stereo sound to come up with a rather nice game. My only complaint is the game's use of the mouse instead of a joystick. I find this very awkward and hope it is changed in a future version.

The manual is very helpful when learning the game, and it contains many hints for staying on the road. If you are looking for a non-stop, thrill-a-minute arcade type racing game, Ferrari Formula One is not for you. I recommend this game to anyone who wants racing strategy mixed with good old-fashioned high-speed excitement.

Hints For Better Driving

1. Never let yourself get "boxed-in" by cars on your left and right. If you do, take the curves fast and the straightaways slow. This strategy is a little dangerous, but otherwise you must contend with them for a long time.
2. Under normal conditions, try to stay in the right lane, slow down for curves, and speed up for straightaways. If you are forced to take the left lane, move back to the right as soon as possible. In case of car trouble, you can pull off and get back on the road quickly.
3. When something minor goes wrong with your car, don't panic. Simply pull off the road and make the necessary adjustments. In most cases, the problem is simple and costs you only a few minutes or sometimes only seconds.

4. Check the flags often. If you don't, you may find yourself out of the race. Speed up as soon as you see the green flag and slow down when you see the yellow flag.

5. If a nearby car has an accident, such as an engine on fire, speed up and move out of the way. This move avoids a collision and delay in your race. If you cannot get around it, slow down and come to a stop. Even though you lose some time, you gain it back faster than you think.

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ARKANOID

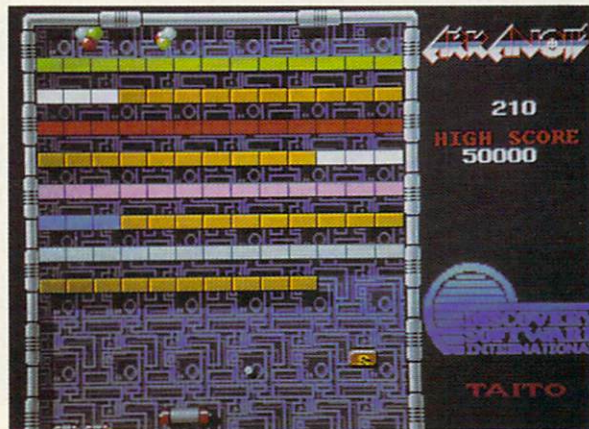
The Ultimate arcade blockbuster!

by Graham Kinsey

Now that the Amiga 500 has been established, I'm sure quite a few of the 500's sales this past holiday season were to people who drool over the Amiga's ability to run arcade-quality games. But how can this need be fully met? Buy an arcade game that is a licensed version of the coin-op version. Unfortunately, while there is now a flood of arcade games out for the Amiga. Few, if any, are officially licensed coin-op arcade ports. But there is at least one licensed arcade game for the Amiga that is quite well known in the video arcades. Discovery Software has ported the hit coin-op game Arkanoid to the Amiga. Arkanoid is licensed from Taito America.

For those who haven't been to an arcade lately, Arkanoid can best be described as a second-generation brick and paddle game. Like the classic Breakout game, the object is to knock down every brick with your paddle. But that's where Arkanoid departs from its predecessors. Arkanoid's first major difference are the colorful mobile obstacles, called Konerds, Pyradoks, Tri-Spheres and Opopos, that appear on the playfield. They are usually only a nuisance, since any hit with either the energy ball or with your Vaus (the Arkanoid name for the paddle) destroys them. Another important difference is that in addition to the eight different colored bricks, there are two special type of bricks. The silver bricks can be destroyed just like the colored bricks, but not with just one hit. Depending on the level you're on, it takes up to five hits to destroy a silver brick. Gold bricks are indestructible.

The final major features of Arkanoid are the power capsules. When you destroy a colored brick, you are sometimes "rewarded" by a power capsule falling from the brick's debris. If your Vaus touches the falling capsule, you receive the benefits of that capsule. There are seven different power capsules. The Slow capsule slows the energy ball down some, although there is a minimum speed for the energy ball, and this capsule tends to be less effective in the advanced stages of a level when few bricks are left. The Expand capsule doubles the size of your Vaus, which is always handy. The Catch capsule turns the Vaus into glue. When the energy ball hits the Vaus, it doesn't bounce off. You can then move the paddle before releasing the energy ball with the left mouse button. This is very useful when careful aim is important, and it also serves as a short rest when the energy ball is moving fast. The Disruption capsule turns the single energy ball into three which all behave like the original energy ball.



Arkanoid boasts convincing arcade graphics.

My favorite capsule has got to be the Laser capsule. This power capsule adds twin laser guns to your Vaus. You can then fire away, blasting any of the bricks (except the gold bricks, of course) or destroying any of the mobile objects.

The remaining two power capsules are special ones which don't appear very often. The Paddle capsule gives you an extra Vaus. The Break capsule opens a small door to the right of the Vaus. You can then move the Vaus through the door and automatically advance to the next level. This door disappears if you lose the present Vaus, so don't dilly-dally about entering the door.

Some power capsules are mutually exclusive. For example, if you presently have a Vaus enhanced with either the Expand, Catch or Laser capsules, and you catch a different power capsule, you lose the enhancements the Vaus previously enjoyed. The Disruption capsule is even worse in this regard. As long as you have at least two of the three energy balls still in play, no more power capsules will appear. Needless to say, this will make many people think twice about catching the Disruption capsule (not only due to the features the power capsules represent, but also since each power capsule is worth a fat 1000 points).

(continued on page 31)

EbonStar

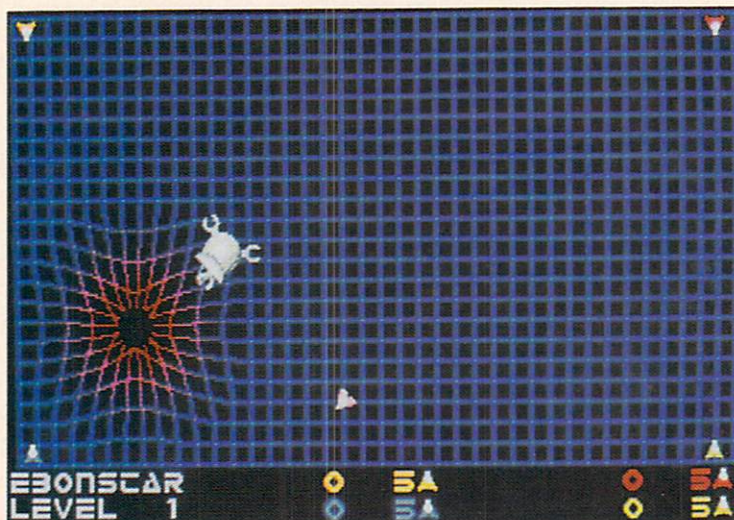
Roman arena fighting meets the black hole!

by Keith Conforti

Roman gladiators in one-man spaceships pitted against each other in a fight to the death in an inescapable arena with an omnipresent black hole. Throw in a few space beasties and an unsympathetic referee and what do you get? MicroIllusions calls it EbonStar.

EbonStar is a refreshingly different space game. In fact, it's not only different from any other space game, it is different from any other Amiga game, period. The slick, truly original concept combines ancient gladiator ruthlessness with space age ramifications.

The result is not only shoot 'em up fury, but a strategic campaign as well.



Arch releases a drone in the four player mode of EbonStar.

Battling the Beasties

EbonStar's premise is far from complex. As one of up to four warriors, you must defend yourself from attack by menacing drones who try to push your ship into a roving simulated black hole, the EbonStar. At the same time, you try to repel your enemies into the same hole. Your only weapon is a short burst of energy that temporarily repels oncoming attackers. If you aim your shots correctly and you can push your enemy near the omnipresent EbonStar...

Whooooosshhhh! Down he goes...

A host of enemy ships inexhaustibly seeks to destroy you and your opponents. Among these meanies are drones, the slowest and easiest to deposit in the EbonStar. Inflictors,

Assassins, MagnePods, and Quarks are all faster than drones and more adept at repelling you into the EbonStar. And the two most deadly, the TeslaSphere and the Nemesis, can blast you into space dust with lethal energy zaps.

Where do all these bad guys come from anyway? That's easy. A computerized referee, named Arch (no, his last name isn't Bunker), reigns over the competition and periodically tosses enemies and obstacles into play. Also, Arch can occasionally surprise you by tossing out a weapon you can use against your attackers. You may be lucky enough to receive guided missiles, fireballs, or lightning bolts, which destroy anything within a certain range—eat your heart out, Rambo.

Arch is a busy dude. As each round of the competition begins, Arch creates the EbonStar and maintains it throughout the match with an energy beam. To advance to the next level, you must destroy Arch and the EbonStar—no simple task! There is only one way to do it; you must make a calculated shot perfectly aligned with Arch's maintenance beam. A stray shot may occasionally work, but to perform this marksman's coup, you need painstakingly careful timing, accuracy, and most impor-

tant, patience. By momentarily breaking this energy beam, both Arch and the EbonStar chaotically self-destruct.

How do you do it?

You can maneuver your ship four ways. Two methods use a joystick with either relative or absolute movement. You can also use the familiar mouse. All options are similar, but none are as easy as using the keyboard. EbonStar is a true keyboard game, but I'm sure many people will use joysticks or mice. Each player's movement can be controlled with just five well-positioned keys, and four players can simultaneously play off the keyboard! It may get a little crowded at times, but it's a lot of intimate fun if you play EbonStar with the right person.

There are three ways to play EbonStar. The most obvious is a single or multi-player free-for-all where everyone attacks everything including opposing players. Success here is probably most difficult because you not only have to knock off drones and beasties, but you must fend off other players as well.

Team Play is a more effective way to play EbonStar. Team Play only works when four players are competing. By forming teams of two, you have double shooting power for double potency against alien ships as well as against the opposing team. Perhaps the biggest advantage in Team Play is that your partner can cover for you while you are destroying Arch and the EbonStar. But beware your teammate! Only honor prevents him from pushing you into the hole and basking in the glory as a successful solo warrior!

If you really despise the relentless attack of drones and any other vermin that Arch hurls at you, Tournament Play is for you. In Tournament Play, the only enemies you encounter are your opponents. Four players can battle it out, and Arch only tosses out special weapons which make a crucial difference in the game.

The Wrap-up

Overall, EbonStar is an original and intelligent game. Strategists can revel in

planning courses of action, while space junkies can appreciate the unique plot and angle.

The graphics and sound in EbonStar are both above average (the opening music is rather appealing). The playability of the game is excellent; within minutes, a novice gamer should be able to master the simple controls.

Don't be ashamed if you occasionally get sucked in due to poor maneuvering. The gravitational pull of the EbonStar is not easy to escape. And once you get the hang of the game, it's not easy to escape from your monitor, either.

•AC•

EbonStar
by MicroIllusions
17408 Chatsworth Street
Granada Hills, CA 91344
(800) 522-2041 or (818) 360-3715

ARKANOID, continued from page 29

The Amiga version of Arkanoid is not only a faithful duplicate of the coin-op version as far as the game's features go, but also in the game's audio/visual aspects. To no Amiga fanatic's surprise, the graphics quality of the Amiga version equals the arcade version. The sound effects in the Amiga version are extremely close to, if not equal to, the coin-op version. The screen layout is different in the Amiga version, with the scores displayed on the right side instead of on top.

The Amiga version also has some added features. You can pause the game or turn the sound effects off. You can also change the speed of the ball up to a pace fast enough to guarantee that the game ends in less than a minute.

A very convenient feature of the Amiga version of Arkanoid is that you can choose your starting level from level one all the way up to level 20. (The game has 32 different levels, plus the final "special"

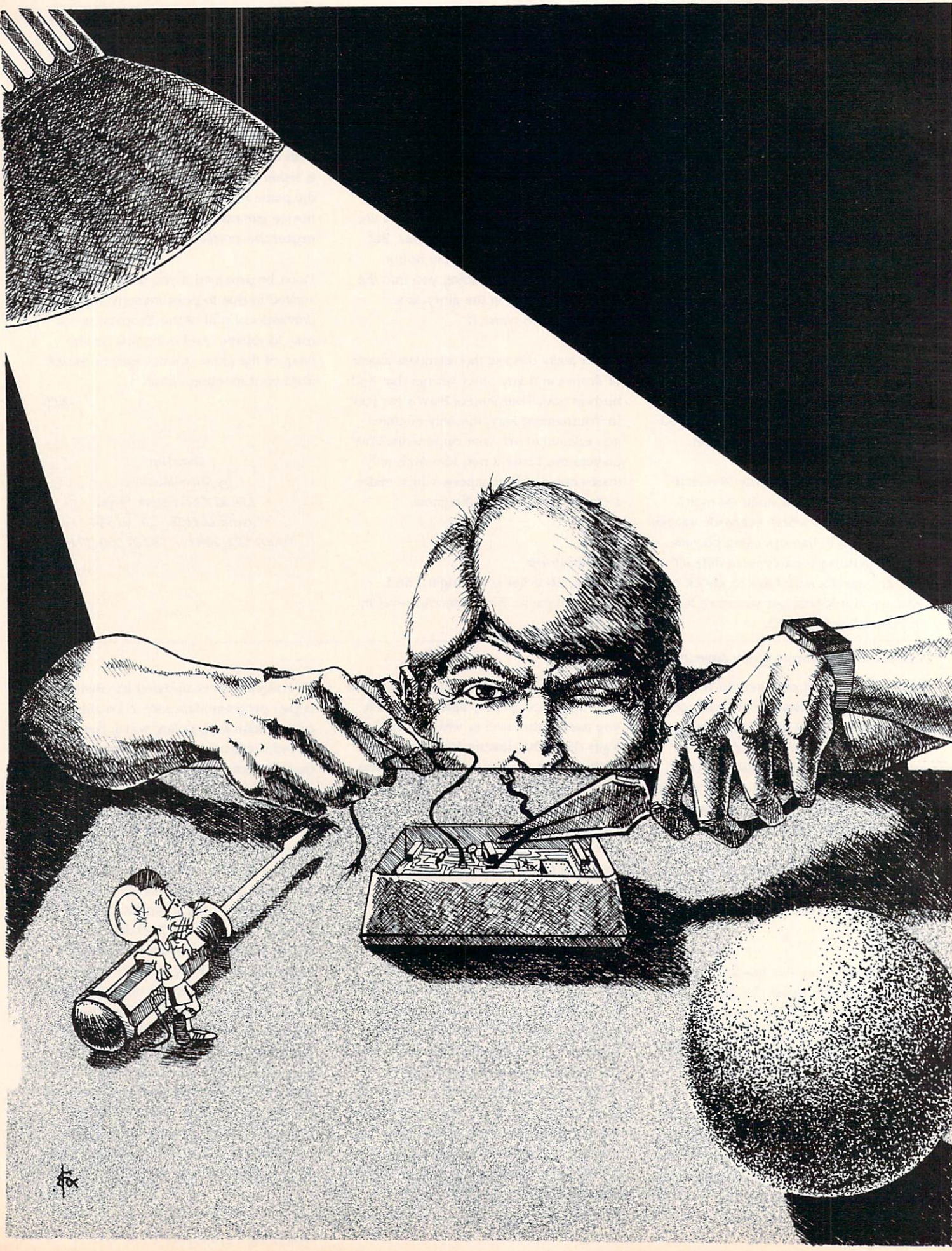
level.) Note that this is not related to the coin-op option to play again, in which you start at the level in which your last Vaus died. That feature is also available in the Amiga version, which allows you to continuously start at the highest level you have previously attained, up to level 32. You only get one shot at the special level however, and then you have to start over again from level 20 or lower.

As for other attributes of the Amiga version of Arkanoid that merit mention, the game is naturally copy-protected. However, unlike certain Amiga games that torture your disk drive due to copy-protection, Arkanoid protection is very gentle on your disk drive. In fact, the game doesn't access the disk much at all during the boot-up sequence. The game's packaging is a pleasant addition, complete with a comic strip story about the background for the game. Discovery includes a coupon in the packaging that allows you to purchase a backup of your Arkanoid disk for \$3.00. However,

Discovery has not updated its own disk copier program Marauder to be able to copy Arkanoid, a policy which has stirred some controversy on the networks (and I'm not going to get into that here).

One final note for those who like to cheat at games: Discovery has told me there is a backdoor in Arkanoid that allows you to do almost anything you want. But they would not tell me what it is, so you will have to find it yourself. If you find out what the backdoor is, please attempt to contact me via this magazine or via People Link's Amiga Zone so it can be passed on to all Amiga users. In short, I can't find anything negative to say about Arkanoid. It is the closest port of an arcade game I have ever seen. I have never seen the game crash, and I don't worry about it wearing out my floppy drive. Unless you detest brick-and-paddle games, you probably will love it too. The only question I have left is, "When will we see Arkanoid 2???"

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for

TrackMouse

by Darryl Joyce

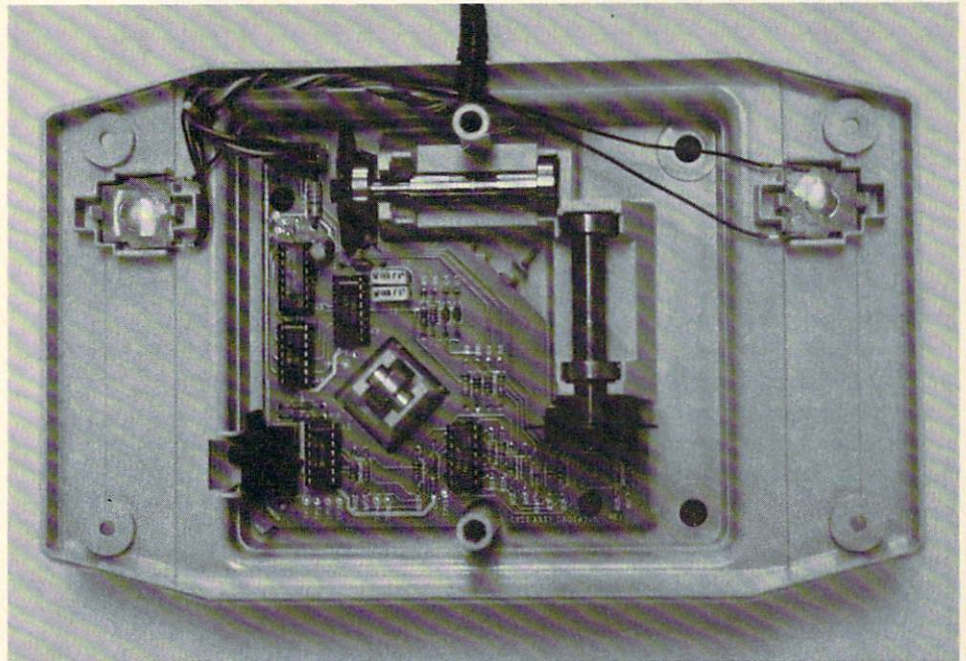
Why use a track ball rather than the handy mouse that is supplied with your system? One reason might be to give some games more of an arcade feel. (A good example of a game that would benefit from this is Marble Madness.) Another reason might be that you want your input device to always stay in the same place; you can probably think of other reasons.

There are at least two options if you want what I call a TrackMouse.

One option is to buy one of the Wico track balls already converted to work like a mouse. It will cost you from \$30 to \$40. The other option is to convert an Atari Track Ball (ATB). The ATB, model number CX22, will work (in its joystick mode) without modification on the Amiga, provided you don't need or want proportional speed control or mouse compatibility. I made my TrackMouse from an ATB I found on sale at a KayBee toy store for \$8. The total cost was under \$15.

Part 1 of this article describes how to open your ATB and remove the main circuit board. Part 2 describes what to look for on the board, and some initial changes. Part 3a describes an option that would be useful if you also want to use your TrackMouse as it originally worked. Part 3b describes how to finish the operation if you are going to be soldering. Part 4 is for those who would rather not solder, and Part 5 describes the finishing touches.

You will probably have to spend at least \$5 above the cost of the ATB (more if you do not have any tools for working on electronics). So before jumping in head-first, look over these parts and prices.



Radio Shack part numbers & prices

10' 9 wire cable	270-1705	\$4.99
Optional		
Vinyl grommets	64-3025	\$.99
In. butt connectors	64-3037	\$.99
DPDT switches	275-626	\$2.19
Type 2 WW tool	276-1570	\$5.95
White WW wire	278-502	\$2.39
Heat shrink tubing	278-1627	\$1.59
4" wire ties	278-1632	\$1.59

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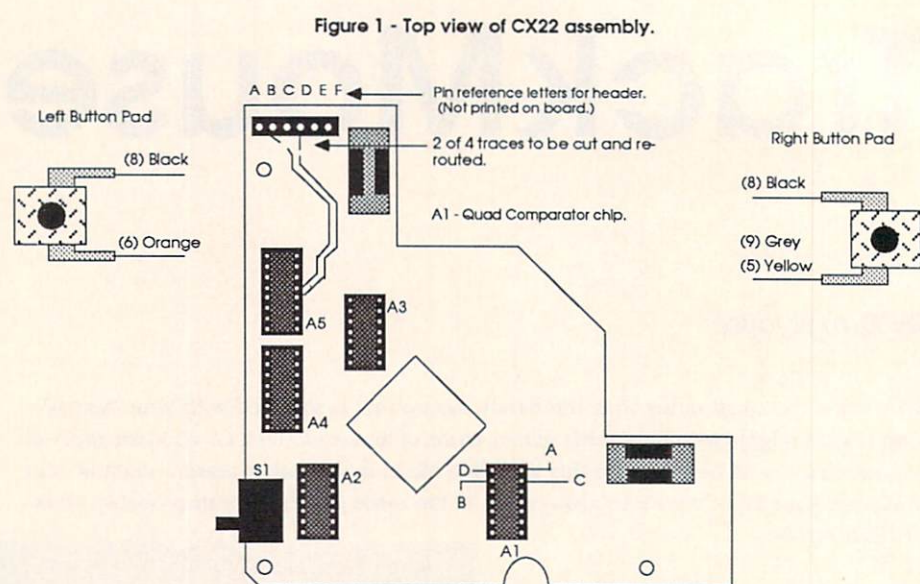
What you need will depend on the method you choose to make the conversion. Be forewarned: this conversion will certainly void your ATB warranty. And, if you hook things up wrong, you might end up with some Amiga problems. You will not be making any changes to your Amiga, so there should not be any problem with its warranty. Now, assuming you still want to play doctor, let's see how to make the conversion.

Part 1: Getting In

First, turn your ATB upside down. There should be four phillips head screws near the four corners of the base. These screws hold the unit's top and bottom together. After you remove these, the unit is still held together by two gray posts in the top. They are held by friction in two hollow posts in the white base. Try to work the top and bottom apart gently. You should be able to rock the halves apart with your hands. If the posts are broken, it won't hurt the ATB, but the fit won't be quite as tight.

If the unit is too tight, try slipping in a couple of screwdrivers or flat sticks between the top and bottom (start on the center sides near the buttons). Work one of these levers towards the center of the top (nearest the ball) and the other towards the center of the bottom. At this point, you should be able to slowly pry the unit open. Just don't stick anything in more than about half an inch, since there are quite a few more important parts that could be broken (such as the motion detection wheels). Also, keep the tools out of the top left (between the left button and where the cable comes out). The wires from the cable and one of the wheels are in this area.

Once the ATB is open, you can set the top aside. Next, remove the ball and the motion detection parts (the rod, bearings, and perforated wheels). Set all this aside too. Now, you should see one large circuit board and two small ones. The small ones are the switches for the buttons. The large one converts the ball's movement into mouse movements (at least it will when you are finished).



To remove the large circuit board, first disconnect the header connector. It should be a blue connector with six pins. There are seven wires connected to it (two black wires are in the right pin). A small flat blade screw driver or knife can be slipped between the rust colored clip on the header and the blue header connector (the clip is toward the edge of the circuit board). While gently holding the rust clip away from the blue connector, pull the connector off the board's header.

Once the header is loose, there are two more phillips screws and two plastic clips holding the board to the base. These screws are on the upper left and lower right corners of the board. One clip is below where the ball rests, and the other is in the bottom left corner. Remove the screws first. Then, work the board out from under the clips (try the lower left clip first).

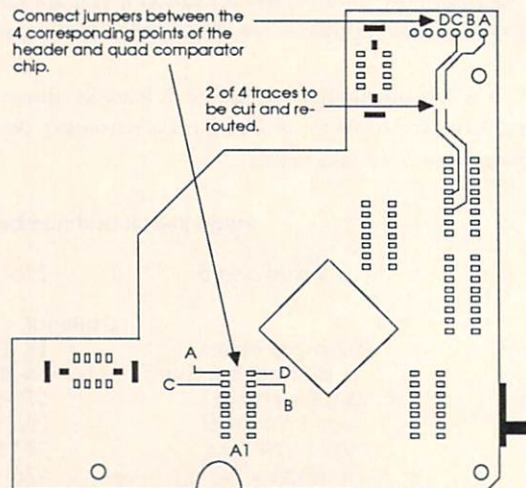
Part 2: The Cut

Now that the board is out, it is time to start making changes. There are four traces that must be cut on the main board. Two of these are on top (Figure 1); the other two are on the underside (Figure 2).

A hobby knife works well for this operation, but a single edge razor blade can also be used. Make a cut on each trace so you can see the board where the cut was made. This should ensure that the circuits are broken.

The one piece of hardware you will probably have to buy is a new cable and connector. The one that comes with the unit has only seven wires. You will need a cable with eight lines connected to a nine pin D-type connector. The easiest way to get this is to buy a ten foot joystick extension cable (which has all nine wires connected). The male

Figure 2 - Bottom view of CX22 assembly.



connector will not be used, but you may want to cut the cable in half and save the male connector for other projects.

Cable Color Chart

Colors found on RS (270-1705) cable and the corresponding pin numbers.

- (1) White
- (2) Blue
- (3) Green
- (4) Brown
- (5) Yellow
- (6) Orange
- (7) Red
- (8) Black
- (9) Grey

The cable color chart should help in identifying which pins on the connector are connected to which color wires. But, check to make sure your cable matches the chart before beginning. Also, be sure the wire colors in your ATB match the original wire colors. You should note any differences before beginning. There are at least two color schemes used in the Radio Shack cable!

Cut the original cable off the ATB, making sure to leave wires long enough to work with at the header. Try to cut all the wires about two inches from where they go into the original main cable. That will make it easier to salvage the old ATB cable as a possible joystick replacement cable. A vinyl grommet can be used to help hold the new cable in place and to keep things looking neat. If you put a wire wrap tie on the cable (suggested), do not tighten it too much. The cable's position will need to be adjusted after it is connected to the old header wires.

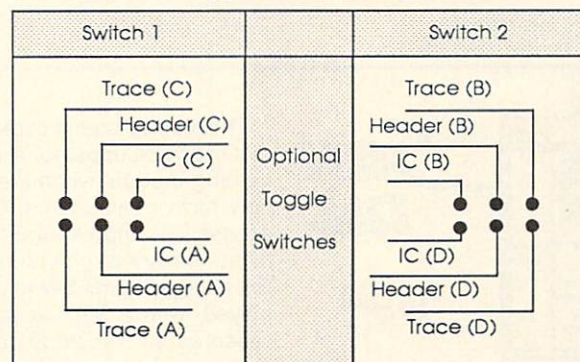
Now, find the 339 quad comparator chip. It should be on the lower right side of the board (Figure 1). Next, skip to part 3a, 3b, or 4, depending on the method you want to use to complete the project.

Part 3a: Your Choice

Skip to Part 3b if you are only going to use the TrackMouse as a mouse on your Amiga. Read on to see how to also use the TrackMouse as it originally works. However, some soldering must be done to make the following modification.

There are five wiring differences between the original track ball and the TrackMouse. The best way to switch between track ball and TrackMouse mode would be a five-pole, two-position switch. But, since that may not be easy to find, another method can be used. You can get away with using two double pole/double throw switches if you don't mind losing the use of the right button as a second fire button. The switches can be mounted on the right and inside of the base. Either cut or melt holes where you want to mount the switches. The handles should stick out at a right angle to the built-in switch on the opposite side. Follow the diagram in Figure 3.

Figure 3 - Toggle Switch Wiring Diagram.



Part 3b: Soldering

Skip to Part 4 if you prefer to wire wrap. But this is really the easiest way to go. If you are new to soldering, make sure you practice first on something you don't care about! Also, you may want to remove the 339 quad comparator chip while soldering the connections to its socket.

Look at the bottom of the main board (Figure 2). Connect 4 wires between the header and the 339 quad comparator chip as shown. Header pin (A) should go to chip pin 14. Header pin (B) should go to chip pin 2. Header pin (C) should go to chip pin 13. Header pin (D) should go

to chip pin 1. If you are not certain of the pin numbers, see Figure 2. There are capital letters at the chip and header indicating which chip pin connects to which header pin (see Header Pin Chart). Skip to Part 5 when you finish.

Header Pin Functions

A	Vertical Quadrangle
B	Horizontal Quafrangle
C	Vertical
D	Horizontal
E	+5 volts
F	Ground

Part 4: Wire Wrapping

A wire wrapping tool can be used to make connections from the header posts to the chip pins. There are two basic styles of manual tools. They both work about the same. I have one of the Type 1 tool (one end of it is used for unwrapping). The Type 2 tool can be found at Radio Shack. I am not sure about unwrapping with the Type 2 tool, but the

method to wrap is the same for both tools. Also, it is possible to unwrap a connection if you do it carefully. You may want to practice on a pin or paper clip if you are new to wire wrapping.

You should have at least three turns of wire on a post to make sure the connection will last.

Be careful when wrapping the legs of the chip! They are easy to twist. Hold the unstripped part of wire against the body of the chip wrapping. Also, try to make the wrap as close as possible to the base of the chip, since the chip has to fit in its socket tightly.

Part 5: Finish and Close

Connect the new cable to the old wires coming off the header (see Cable Conversion Chart and Cable Color Chart). First, use solder or insulated butt connectors to attach the header connector to the cable.

Be careful of the colors, since they don't all match the original wire colors. The

(continued)

Cable Conversion Chart

Pin reference letters for header	Original colors on header	Pin out for new cable (See Cable Color Chart)
A	Green	(3)
B	Brown	(4)
C	White	(1)
D	Blue	(2)
E	Orange	(7)
F	Black	(6)

colors and numbers on the button switches are only for the new cable. The black button wires will already be correct. Connect the red button wires to the new cable's wires as indicated (orange on left and yellow on right). The gray wire (pin 9) is not needed, but you can connect it to one of the buttons (only one—using either the orange or yellow wire) if you do not want it left loose.

If you do solder the connections, try using heat shrink tubing to cover them. It is neater and easier to work with than electrical tape. Cut the tubing just a little longer than the exposed wire length, since it will shrink a little in length when

heated. Remember to slip a piece of tubing over one of each pair of wires before soldering them together. Heat the tubing until it stops shrinking.

It is possible just to twist the wires together if you are using heat shrink tubing. If you do, make sure to provide for strain relief with a wire tie and vinyl grommet.

Double check your connections and tighten the wire tie when you find out how much covered cable you need in the box (about an inch should be sufficient). If a grommet was used, its center should slip in the cut-out from the old cable already in the base. The wire tie goes behind the grommet (inside the box) to hold it in place. If the wire tie alone is used, be sure it's inside the box.

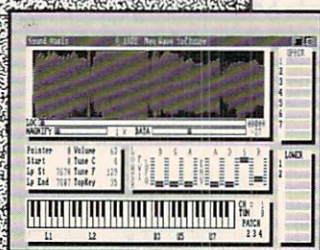
Put the main board back in and replace the two screws. Connect the header connector to the header (the connector

will probably not go down far enough to be clipped if you used the wire wrap method). Put the moving parts back in the box. Then try using the TrackMouse just as you would your mouse. You may want to leave the top off when you do this. Also, make sure you have routed all the wires where they will not be rubbed by the moving parts. When you are satisfied it works, put the top on and replace the four screws.

You should now have a working addition to your input devices. There are other options you may want to add. For instance, you can add another set of buttons parallel to the normal buttons—on opposite sides. That way you would have access to both mouse buttons with either hand while using the ball.

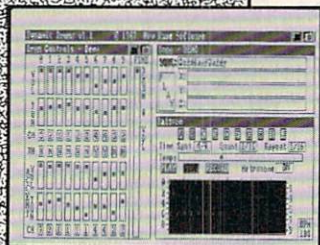
You could also add a switch for the right fire button if you made the unit switchable between TrackMouse mode and Atari mode. If you write any of your own software, you could add a third button and hook it to the gray wire and ground (black wire).

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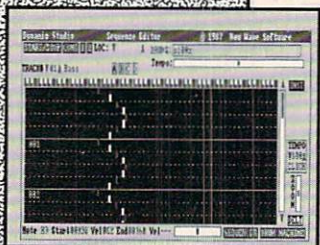
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The internal sound capabilities of the Amiga are better than that of any other personal computer. These capabilities mean nothing though, without quality digital sounds, which up till now have been scarce. Sound Oasis gives Amiga owners access to a large library of studio-tested digital samples, by using the Amiga's built in disk drive to read disks made for the Mirage Digital Sampling Keyboard. Sounds can then be played from a MIDI keyboard, the computer keyboard, or saved as an IFF standard file. Mirage is a trademark of Ensoniq Inc.

Transform your Amiga into a professional-quality drum machine with this software package. Easier to use than hardware-based drum machines because everything is displayed graphically on screen. Enter drum patterns quickly and easily in real time with visual feedback and editing. Create realistic drum tracks with any of the 100 drum and percussion samples that are included or use your own unique IFF one-shot samples. Dynamic Drums also has full MIDI implementation and even becomes velocity sensitive when triggered from a MIDI keyboard.

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Amiga Interface for Blind Users: An Adventure in Practical Programming

by Carl W. Mann

There are lots of things one can do with an Amiga. It isn't often that a personal computer promises to open up the world to an entirely new class of potential users. As you read this, though, please be advised: at this very moment, the Amiga is on that brink.

The "new market" the Amiga is on the verge of opening is actually an extremely old one: the blind and sight-impaired. Although numerous attempts have already been made to bring various computers to blind and other special-needs users, only limited success has been achieved to date. This is due in large part to the following factors:

- 1) *The machines used to date have been single-tasking 8-bit systems.*
- 2) *Applications therefore must be "hard-coded" and tend to be quite inflexible.*
- 3) *Their 5.25" disks are subject to instant destruction through human contact.*
- 4) *They are costly and difficult for the end user to maintain.*
- 5) *They require extensive hardware modifications before becoming at all useful.*
- 6) *The actual application programs that are available tend to be severely limited in selection, scope, and performance. These include both application programs and (to an almost total extent) programming tools and system utilities.*

The Amiga 500 hardware alone overcomes all but the last of the above problems. Its 3.5" floppy disks cannot be

inserted backwards or sideways. The metal shutter insures that even the clumsiest stray thumb cannot damage the medium. The Amiga's built-in speech synthesizer outperforms dedicated units that sell for ten times the price. Its powerful 16/32-bit design and fast, multitasking operating system pave the way for extensive vertical development. Its unitized design and full-size keyboard are also real bonuses here.

So how does one design a useful interface for a blind user? Frankly, it takes some doing on any computer. The Amiga is no exception. Its multitasking ability enables one to conjure up results greater than the sum of the parts. (Did you know that the Amiga is dimensionally transcendent? It really IS bigger inside than outside!) But it's still up to the developer to pick the winning combination. And in a few important ways, the machine is merely, ahh, different.

Although the Amiga is by far the best hunk of hardware ever adapted for the purpose, adaptation is still the first order of business for the special-needs Amiga developer. Numerous small details of the machine's operation must be accounted for and dealt with in ways which are unusual to a sighted programmer. All that wild-eyed talk about 4096 colors and overscanning HAM, SuperBitMap, scrolling, animated video graphics displays suddenly becomes as relevant to the problem at hand as a bicycle to a newborn fish. These things are useless to a blind person! On the other hand, I just don't worry about conserving "chip" memory anymore. Ol' Fat Agnus could hide in her closet until a hot place freezes over, for all I care on this project.

A number of rather large obstacles had to be overcome before the machine became usable. These can be divided into two broad categories: the initial development environment and the final end-user applications.

Applications and Development Tools: An Essential Adventure

You can't build a talking computer system without tools. But a blind developer can't have the right tools until the machine can talk. It's a nasty dilemma. I faced it head-on for hours after my partner David brought his Amiga home.

It's my fault, really, that we're involved in this project. You see, I talked David into buying an Amiga in the first place. We met at a Boston community gathering—one of those wonderful all-are-welcome affairs where anybody at all can drop by and share work, pretzels, and conversation. We had been introduced and talked for almost twenty minutes before I realized that he was totally blind.

David mentioned that he was shopping for a personal computer with speech capabilities, and I strongly (and foolishly) recommended the Amiga. My recommendation was based on the three months or so of experience that I had with my own A1000. I had no idea what I was getting us into. We found out soon enough. David bought his A1000 that weekend. Then we had to make the beast speak!

We discovered in short order that the existing commercial Amiga talking software packages were toys. Most packages were games, with speech thrown in as a gimmick to keep the

(continued)

kiddies enthralled for an extra hour or two before demanding something fresh. Racter wore thin in about two weeks. Neither of the "serious" commercial packages (Talker by Finally! Software and A-Talk by Felsina) completely addressed the real needs of the average blind user. (Felsina, to their eternal credit, promptly corrected major goofs David discovered in A-Talk's speech functions.)

So here are two disappointed people, one of whom has spent a large amount of cash for a talking computer for which no useful talking software exists. The other has just talked the first one into spending the cash. Both of us are darn near broke. We're both out of work. So we did something completely different.

Some folks might say we did the foolish thing. I don't know. Time will tell. We donned our Peril-Sensitive Sunglasses and declared ourselves in the business of developing a completely practical, mouse-free Amiga work environment for blind computer users. Then we got busy.

We spent two solid months evaluating the inadequacies of the products we had bought. We shopped desperately for the tools with which to build a viable solution. We had the vague idea that the job could be done with macros. But no macro package could be found that had both CLI and Intuition capabilities.

Then Meridian Software's Zing!Keys hit the market. Now, I don't often enter nirvana via the merits of a new computer program, but this was decidedly different. As it turns out, Meridian's Jerry Farmer had a friend years ago who happened to be blind. Jerry hadn't seen his friend in years, but the experience must have left a lasting impression. His Zing!Keys can turn the most complex Amiga operations into a two-keystroke piece of cake. The most bizarre concatenations of mouse, CLI, and heretofore undefined keyboard maneuvers are child's play to Zing!Keys. The early release had a couple of glitches, which Mr. Farmer promptly fixed. The current release is quite stable and reliable.

It took about three weeks of solid work to complete an alpha prototype of a working interface for A-Talk. David and I both spent big money on telephone calls. We had to work closely together. I had to learn experience the world quite literally as David experiences it in order to know how to proceed.

You know what? There's really only one way to develop anything for a blind person. You have to let yourself become one for a while, at least in some significant part of your mind. It's the only way you'll ever understand the issues clearly.

Now, I've seen some incredible things from time to time. But I'll never forget the look on the face of David's mother when she first walked into the room to find her son adjusting his new computer's communication parameters totally unassisted—and me standing there, swinging the mouse plug on its disconnected cord and grinning (and otherwise looking) like Zippy the Pinhead! That moment alone was worth everything that went before.

And Onward...

So a sighted person can overcome innate personal deficiencies and learn to develop software for a blind person. Ho hum. I'm a writer, not a programmer. I have no formal training in computer science at all—just a healthy respect for what works and for the people who make things happen right. But David has a degree in computer science, and the life experience to qualify him completely for the development work. Me, I'm best at ringing bells and making appointments. Thus are partnerships born, no?

David's presentation tells the rest of the story. He has taken over the development of the Freedom Machine's talking word processor, text editor, database, and spreadsheet. I'm building the necessary development tools (including LOTS of Zing!Keys macros) as required. Our software manuals now use Amiga speech on floppy disks. Touch a key and lean back—Amiga does the rest. We start

recording the "live" versions of the manuals as soon as my Significant Other finishes a computerized English literacy project he's currently working on.

The list of contributors is large and growing. It includes Jerry Farmer of Meridian Software, Marco Pappa of Felsina Software, Opher D. Kahane (for his Shareware talking text reader program, PrinText), Perry Kivolowitz of ASDG for FACCII (the floppy cache program) and Charles Heath of MicroSmiths for donating a beta release of TxEd Plus, a truly wonderful Amiga ED replacement. The text engine which promises to become the Inspired Interfaces Talking Word Processor, Talking Database, and possibly even the Talking Spreadsheet is itself a Shareware product of Rick Stiles. It's called UEdit. And to Fred Fish, whose Amiga library series repeatedly seeds this project so generously. And everybody else, too. Thank you!

There are still a few missing pieces to the puzzle that is this project. The most glaring item is the Amiga speech implementation itself. Has anyone out there written a replacement "say" which says *everything* without exception? If not, would you consider doing it on a chance or a dare? And could you make it a logically addressable device, maybe? There's fame and (if you want it) even a little mammon in it for you once we get this baby to market. Please get in touch.

Other items on our Freedom Machine shopping list include a way to switch the pronunciation of punctuation and diacritical marks on and off at will. It doesn't matter how. Any old way will do. A multitasking "control panel" program which overrides an application's existing default speech parameters is also needed. Can you help? Please call! We want to finish this job!

Are you or do you know a blind or visually impaired person who needs or wishes to use a computer? Please contact us care of Amazing Computing. We may be able to help each other.

•AC•

The State of the Silicon Art for the Blind: A Report From Them That's Doin'

By David L. Hunt

The Vision

We have designed and prototyped a complete Amiga software access system especially for use by the blind and the visually impaired. This prototype is the first step toward fulfilling some basic requirements we feel should be met by all such systems. These requirements include the following:

First, the system should be easy for the user to install and use. All cables and connection points must be appropriately marked. The installation process should be documented in the best way possible to prevent user error. This includes instructions both on tape and in Braille, to accommodate a wide range of user proficiencies. A sight-readable, printed "backup" copy of all instructions is also necessary as a last resort document.

A full complement of completely accessible application software packages should be provided with the machine. The user interface should be standardized across the entire range of application packages. Interface operations should require the minimum possible number of key strokes. There must be no exotic command language to memorize. A comprehensive on-line help facility and full access to all menus must exist. As with installation instructions, all software manuals must be provided on cassette, in printed form, and in Braille.

The user interface must provide for full speech control. The user must be able to control the speaking of punctuation symbols, spelling, and so on. It is also helpful to be able to adjust word rate, sampling rate, voice gender, and pitch.

The Prototype

We call our prototype system the Amiga Freedom Machine. The Freedom Machine approaches the requirements listed above for such a complete package. It is based on the inexpensive and powerful Amiga 500 personal

computer. The complete package includes the Amiga 500, internal memory expansion, an external disk drive, and (optionally) a low-cost monochrome monitor. Several talking application programs are included as well. The first release includes talking terminal, word processor and text editor packages.

We plan for text output both in printed characters and Braille (Level 1 and Level 2) through an inexpensive, optional daisywheel printer. (If Braille output is not desired, any printer supported by Preferences may be used.) In addition, we are developing Braille and cassette copies of all Freedom Machine documentation. No formal training in computer science is required of the user for ordinary use.

Thus far, we have completed and extensively tested the terminal program. The package is based on Felsina Software's generally excellent product, A-Talk. Although this program was originally designed for a knowledgeable and computer-literate blind person, we have radically modified the front-end user interface to fit the requirements of an inexperienced blind user. Here's why:

In its original state, it is impossible for a blind person to use A-talk without assistance. Although generally designed with a blind user in mind, A-Talk (like most other talking Amiga programs to date) still uses the Amiga's mouse-driven and intensely visual Intuition interface. However, since A-Talk was the closest thing to what is really needed of all the terminal programs available on the Amiga, we decided to develop solutions to its shortcomings.

Developing the Interface

We found Meridian Software's Zing!Keys, an extremely powerful and comprehensive Amiga keyboard and mouse macro utility, to be the answer to our interface needs. Through Zing!Keys macros, we

finally developed a complete Amiga application access system. We now have total keyboard access to all A-Talk menus and submenus. We also have comprehensive talking on-line help and directory listing functions. Full speech control (to the best of A-Talk's somewhat limited abilities) is mapped into the Amiga numeric keypad, along with the directory and file manipulation functions. Macros for copying, deleting, and renaming files are all included. System requesters are also handled through the keypad.

All A-Talk pull-down menus are entered by holding the control key and pressing its corresponding function key. While holding the control key, the user can move up and down the activated menu by tapping the corresponding arrow key. A submenu is entered by using the right arrow. The left arrow is used to exit the submenu. Items may be selected singly or in combinations, reflecting standard Amiga practice. Amiga/alt keystrokes replace mouse clicks during menu selection, allowing items to be selected from multiple menus with ease. Every feature the program offers is thus brought to the operator's fingertips.

The talking on-line help feature provides indices to the pull-down menus, native program functions, the directory facility and other vital system functions. The top level is entered by pressing the help key. This help file is a guide to the rest of the help system. Individual help files are invoked in a manner that closely resembles the function for which help is desired.

The help files may be accessed at any time except while one is inside the menu structure. The automatic directory system can provide a spoken listing of either disk drive's root directory alone or it can include listings of all subdirectories. We have also provided numerous other directory options. A full explanation of the directory system is found in the help index.

(continued)

The Evaluation

I believe this interface scheme is easy to learn and use. Braille reference cards and keyboard templates will make learning the system even easier. But most important, it gives the user total freedom!! I have been using the terminal program for several months and really enjoy it. Though I found the interface strange at first, I mastered it in minutes. I was able to adjust all terminal settings without any sighted assistance at all. I hope that users with no prior experience on other speech synthesizer systems find this product as friendly as I do. Our beta testers should be such users.

Right now, the Freedom Machine prototype still falls slightly short of our ultimate objective. For instance, the speech control provided by the terminal package (as mentioned before) is not really complete. While it allows the user to choose whether certain punctuation marks are to be pronounced or ignored, for example, speed control is not

available. Also, it would be very good for the speech output mode changes to take effect immediately. Since A-talk is Felsina's product, we must await an upgrade from the author (who has always been helpful) for this feature to appear. We are now developing a truly useful word processor based on Rick Stiles' programmable shareware text engine, UEDIT.

•AC•

Products Used in Development:

A-Talk
Felsina Software
3175 So. Hoover St.
Los Angeles, CA 90007

Mouse-Free A-Talk Macro Kit
Mouse-Free PrinText Macro Kit
Inspired Interfaces
30 Warren Avenue
Amesbury, MA 01913
(508) 388-3736

PrinText Talking Text Reader
Opher D. Kahane
3832 Howard Avenue
Los Alamitos, CA 90720

TxEd Plus Text Editor
MicroSmiths
Box 561
Cambridge, MA 02140
(617) 354-1224

UEdit Text Engine
Rick Stiles
Box 666
102 LaRue Court
Washington, IN 47501
(812) 254-4986

Zing!Keys
Meridian Software
9361 W. Brittany Ave.
Littleton, CO 80123
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Deluxe Productions

A user's perspective

by Harv Laser

Video Wizardry Brought Home

Television professionals, those highly paid video wizards perched in glass booths in front of millions of dollars of sophisticated video gear, make it look so easy. Flip on your set anytime and you can see stunning chrome or glass titles glinting across shimmering images which swoop down onto impossible landscapes of geometric designs. Turn on your local news and watch as the meteorologist stands before a map embellished with moving clouds, smiling suns, and radar projections of looming bad weather.

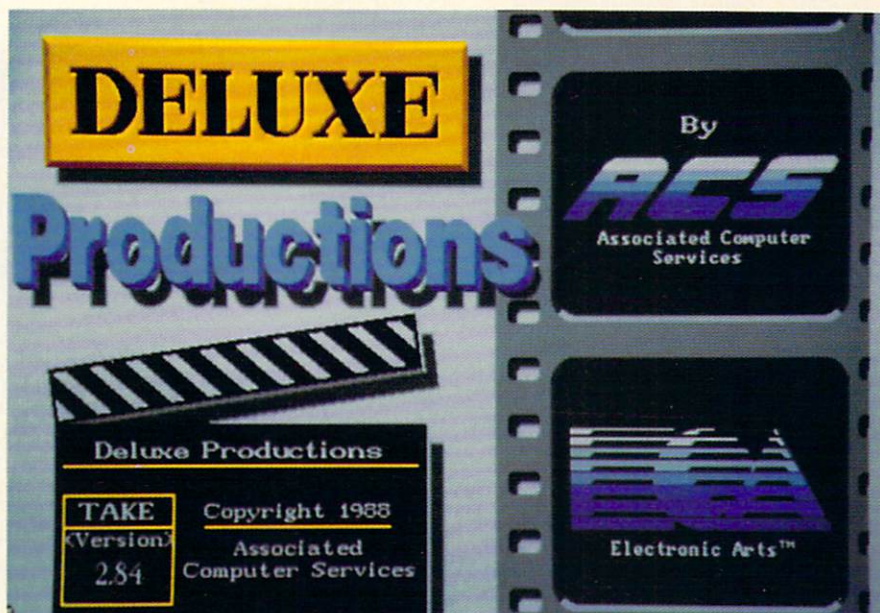
If you have cable, you're familiar with local video productions—simple scrolling billboards of upcoming programming, names and titles flashed across the screen during a city council meeting or sporting event, and, of course, constant advertising. Some is polished, some is terribly amateurish, but it's always geared to grab and hold your attention during the brief thirty seconds sellers have to slam home sales pleas.

Some of this video wizardry has come home to the Amiga. The really spectacular effects, like 3D-flying network logos, require more sheer processing power and video resolution than the Amiga can currently handle (save your pennies and buy a Pixar II!). With the right software and a lot of experimentation and practice, though, we can create video presentations for the Amiga as good as any you might see on a local cable channel.

During a recent vacation, I stayed in a hotel which piped a closed-circuit channel into the guest rooms to plug its shows and restaurants. All titling and moving graphics on that channel were created with an Amiga and various paint and animation software. The graphics were then output to a VHS tape deck, just like one you might have at home. For that kind of use, the Amiga's high-resolution mode is just fine.

A Powerful New Resource For Video Creation

Deluxe Productions from Electronic Arts enables you to create just that kind of production. This is a very powerful and complicated piece of software which can deliver smooth, artistic results. With Deluxe Productions, you can design multi-screened presentations with many eye-catching transitions between segments, and use animated objects and flying titles to spice up your show. If you're lucky enough to own genlock equipment, your productions can be laid over live video. All this flexibility comes at a comparatively high price and has some rather rigid hardware requirements.



(continued)

Before you consider purchasing Deluxe Productions, you should be aware of its limitations as well as its capabilities...

Deluxe Productions operates only in the Amiga's "High Resolution" mode. Its user interface is hi-res and all productions you create are hi-res. You cannot use any other resolution pictures or brushes. HAM mode pictures are definitely out. Your own artwork must be converted to hi-res before Deluxe Productions can accept it. For this reason, you should have Deluxe Paint II, so you can create new screens and brushes and use fonts for creating titles in hi-res. Keep in mind, though, that Deluxe Paint II cannot

Because of the "double-buffering" techniques it uses, Deluxe Productions exhausts just about every available byte of the Amiga's CHIP RAM. As of this writing, every Amiga ever made has a limit of only 512K of CHIP RAM built into the machines' hardware architecture. A500 and A2000 owners may soon be able to purchase new custom graphics chips which let you expand your CHIP RAM limits to one megabyte and possibly beyond. A1000 owners would have difficulty doing this since the A1000 was designed to accommodate only 512K of CHIP RAM. There are simply not enough address lines on the motherboard to handle more. Commodore has not

first, and they must not open any Intuition windows. Intuition windows would deplete the CHIP RAM pool that Deluxe Productions demands when it starts up. Booting Deluxe Productions' main disk (which, thanks to Electronic Arts' new policy, is not copy protected in any way) ensures that the program loads.

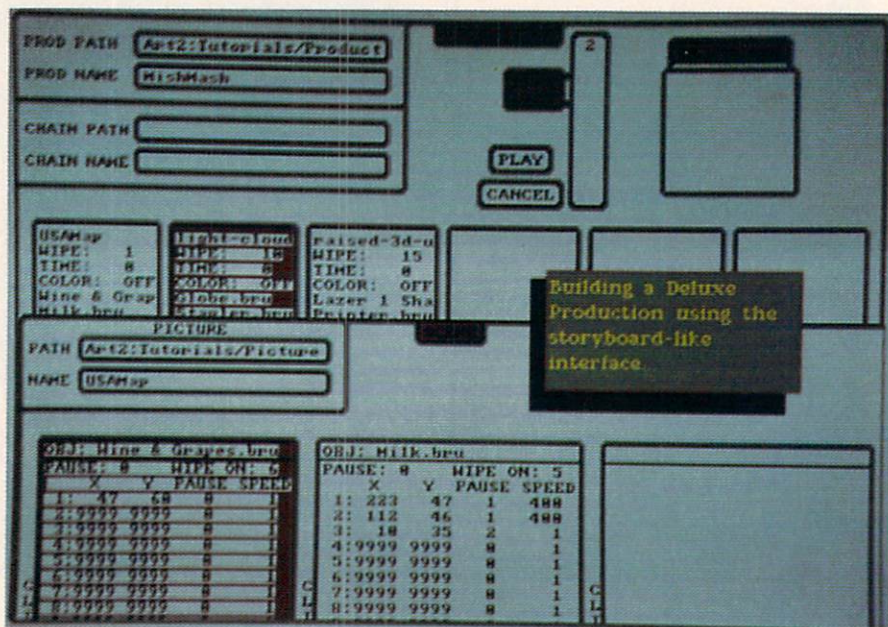
If you want to mount your hard drive so you have access to its files, or you want to use a mouse accelerator, recoverable RAM disk, or disk-buffering program like FACC, you have to modify Deluxe Productions's startup sequence and add your program files to the disk. Even then, be careful how many other programs you try to cram into memory before Deluxe Productions loads. The program is very finicky about this. If it doesn't load because of insufficient CHIP RAM, GURU-like flashing red alert tells you so. (Alerts use less CHIP RAM than requesters or windows). You're not told how much more RAM is needed, only that you don't have enough. Rebooting is often necessary, since removing other programs might not get rid of the alert.

Once the program is loaded, you can't leave Deluxe Productions' environment without quitting the program. Trying to flip screens or pull them down to reveal underlying screens has no effect, since Deluxe Productions closes the Workbench when running. Depending on your memory limits, you can load Deluxe Productions completely, or, using a built-in "overlay" trick, you can load only part of the main program into memory. This trick gives you more memory to work with, but causes more disk access when the program needs to fetch another "part of itself" from disk.

Deluxe Productions can be mounted on a hard drive, and an accessory program moves all necessary files. The 150-page ring-bound manual explains all this quite nicely and includes warnings about insufficient RAM.

The Storyboard Approach

Have you ever seen old Walt Disney television shows where you got a glimpse behind the scenes at the



handle HAM mode pictures either, so if you have HAM images you want to use in a production, you need a program such as PIXmate or Butcher-2 to convert them. Deluxe Productions has no built-in painting or text-handling capabilities. All artwork must be created with other software.

The hi-res mode provides the sharpest and cleanest picture, but at the expense of much memory. Deluxe Productions absolutely requires a minimum of one megabyte of RAM. The program simply does not work with less; it won't even load.

announced plans to support additional CHIP RAM on the Amiga 1000, but don't despair—third party vendors are rumored to be working on ways to give 1000 owners the same enhanced graphics capability as A500 and A2000 owners have at their disposal. With about 150,000 A1000's out there, the market will be ignored.

Deluxe Productions does multitask, but in a very limited way. There are tricks to get other programs running in the background, but they must be loaded

conception and planning meetings for a new animated cartoon feature? Artists laid out quick sketches of backgrounds, characters, and plot development, then pinned them to a wall like a giant comic book. The producer then had a visual outline of the final work. This is the storyboard technique Deluxe Productions uses to piece together your presentation.

When creating your presentation with Deluxe Productions, you work in an interface of many levels of "boxes" which describe the action and controls (see figure one). At the top level, boxes represent up to twelve scenes per production. Each scene can contain one background picture and up to five "clips." Each clip can hold one object (an IFF "brush" file), and a path for that object. An object may travel into, around, and off the screen on its path which can have up to 10 "points" describing the direction of movement. Other windows let you change an object's speed and direction down to single pixel accuracy.

Gadgets allow you to use 40 different wipes between screens, change the speed of events, add color cycling, and fine-tune all timing. The wipes are the usual fades, spirals, venetian blinds, random squares, and vertical and horizontal pushes and pulls.

You build up your production by constructing scenes one at a time. You're free to change scene order through Deluxe Productions' "clipboard." The clipboard is a temporary holding bin that lets you cut and paste whole clips or scenes, duplicate or delete them, and move them around quickly.

While assembling your creation, you can view the entire production at any time, take a look at a range of scenes, or even check out one scene or clip. You can play your productions forward or backward and pause at any point. This feature lets you fine-tune individual portions of your production, viewing the entire thing from beginning to end each time you want to make a little change.

Where Does the Artwork Come From? Deluxe Productions is shipped on four

3.5" disks. The main program resides on a bootable system disk; another holds various utilities, three hi-res fonts, and some artwork used in the manual's tutorials. The final two disks contain artwork. Some of the clip art is beautiful, especially the backgrounds on which you can lay titling. Many of the brushes are excellent, and some ... well, perhaps they're there just to fill up the disks. I don't have any use for a whole directory of foliage. Maybe you do.

You can probably use at least some of this clip art in your own productions, but you'll eventually have to either tap a new source or create your own. Deluxe Production's manual recommends Deluxe Paint II, and so do I. It can handle the hi-res and overscan modes you need for screen and brush creation.

To make your own clip art, you also must become familiar with color registers and color palette manipulation. Since hi-res is capable of displaying only 16 colors at once (out of a possible 4096), your brushes and screens must agree on which 16 colors each uses. Otherwise, you get very unexpected results when you try to lay a brush atop a picture. Deluxe Productions accommodates you to some extent with another screenful of gadgets where you adjust which color registers each screen and each brush uses when they're put together.

Look around for other sources of clip art. There is quite a bit available for the cost of a download from a BBS or a national network. If you own Shakespeare, a color desktop publishing program, an abundance of beautiful hi-res color clip art is available there as well. Unfortunately, that artwork is not available separately. For more fonts, again check the networks or investigate packages of commercially available fonts.

Consider this as well: many talented Amiga artists out there are just aching to get public exposure and even make some money from their work. Almost any experienced artist will be glad to show you a portfolio and work at creating custom artwork for your

particular project. Check with local Amiga user groups and commercial dealers if you need to hire an artist.

Putting It All Together

Despite all the thought and energy that apparently went into Deluxe Production's user interface, the program takes a fair amount of time and patience to learn. There are many parameters you can control, and because the program is so memory-hungry, the inability to flip to another screen, load a paint program, and change and resave screens or brushes is very frustrating. I could even see the need to have another Amiga just to be able to multitask this program!

Once you have finished making your production and fine-tuned it, you'll probably want to share it with friends. Unlike some Amiga video software, such as VideoScape 3D, Deluxe Productions does not compress all screens and brushes into one large file; all pieces are left as separate disk files. The production script itself, while usually very small, is not editable ASCII text. It is saved in a binary format that can only be changed from within Deluxe Productions.

Since the script contains specific diskname (not device name) assignments telling Deluxe Productions where to find the elements of your animation, and since you cannot easily edit the script, the Utilities disk contains a "Mover" program to let you copy all pieces of your production from one disk to another. A freely-distributable "Player" program allows others to view your production without Deluxe Productions.

When I attempted to build a production to show at a local user group, I ran into a few "gotchas":

The Player program requires almost as much CHIP RAM as the main program! The Player is also very finicky—it wants to find an existing subdirectory, brought over from the Utilities disk, before it plays a production! The Player should have been made into a completely free-standing utility. (Most other Amiga

(continued)

animation software packages have this type of utility.) Deluxe Productions should offer an option to save script files in ASCII format as well as binary. They could then be fine-tuned without loading the entire parent program.

A Quick Peek at the Competition

If you are interested in this type of video production, a few other programs may be worth a look. The Zuma Group's TV*SHOW has list of features very similar to Deluxe Productions' list. TV*SHOW has some differences, though: It can load any format screen, including HAM; it can move brushes across pictures, but limits you to only a starting and ending point (not a 10-point path like Deluxe Productions). TV*SHOW's user interface is easy to master and multitasks readily.

The Right Answers Group's The Director is entirely script-based. It has no user interface, but if you have a working knowledge of BASIC, you can create wonderful animations with The Director. The language incorporated here is very

similar to BASIC. This program also deals with any format picture or brush and lets you include ".anim" files, as well as speech, sampled sounds, and live interactive text input.

PVS Publishing's new Pro Video Plus is another non-multitasking "take over the machine" program. It lets you use an inexpensive Amiga for video jobs that previously required dedicated title-generating hardware.

Whatever product you end up purchasing to handle your video production chores, keep one thing in mind: support after the sale. Your dealer should know how these complicated programs work, but when you run into problems that the dealer can't handle (and believe me, you probably will), direct support from the publisher is necessary.

Electronic Arts offers excellent customer support. During my research for this review, I phoned them three times with technical questions about Deluxe Productions. The customer support

people were polite, professional, and returned my calls if they didn't have an answer handy.

If Deluxe Productions entices you, and you think it might be the package to tackle your video chores, get a hands-on demonstration at your local Amiga dealership. I've pointed out the program's strengths and weaknesses here as a starting point for comparison, but there's no substitute for personal experience when it comes to buying software.

Deluxe Productions \$199.95

Not copy protected

Requires 1 megabyte RAM

(more recommended)

Printer, second floppy drive, hard drive optional

Written by: Associated Computer Services

Published by: Electronic Arts

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Video in the Sunshine State!



RGB Video Creations Hosts The Latest Video Unveiling!

by Stephen R. Pietrowicz

On June 4th, 1988, RGB Video Creations held an Amiga show in Palm Beach Gardens, Florida. The show may have been small, but the ideas, equipment, and applications shown were impressive.

If the name RGB Video Creations doesn't ring a bell, it should. RGB brought the DeluxeHelp series of online tutorials to market. The DeluxeHelp series covers programs such as Deluxe Paint II, Photon Paint, Calligrapher, and DigiPaint. DeluxeHelp gives you a live demonstration of how things work within the program you're learning. It simulates mouse movements, and uses the Amiga's built-in speech capabilities to explain which key strokes and mouse keys are used. DeluxeHelp also has online text explanations for every program function. RGB plans to release tutorials for PageSetter, SuperBase Professional, and AmigaDOS.

Charlie Fair of C Ltd showed off C Ltd's new scanner. Using the scanner, you can feed a paper copy of an image into your Amiga. The image is converted to IFF format and can be read into any program that supports IFF. C Ltd also showed a 10.5 MB removable media drive.

Andre Frech from Commodore had an Amiga 2000 loaded with an Applied Reasoning PC-Elevator 386/387 board, the Bridgeboard, the A2058 8 megabyte board (with 1 MB installed), the A2052 2 MB Board, the 2090 hard drive controller, and the A2300 genlock. He showed demos of an IBM CAD package running at normal Bridgeboard speed, then displayed the same demos to show the speed of the PC-Elevator board. Needless to say, the 386/387 combination gave quite a boost to the machine's power!

A beta version of the newest G.O.M.F. (Get Outta My Face) utility was also shown. G.O.M.F. 3.0 is a combination of hardware and software that catches all Guru mediation errors. The hardware device is installed under the Agnus chip. The prototype had a small button attached, so when an error occurs, you simply press the button and information about the error is dumped.



Stan Sult of Videomedia using the AmigaLink software from RGB.

(continued)

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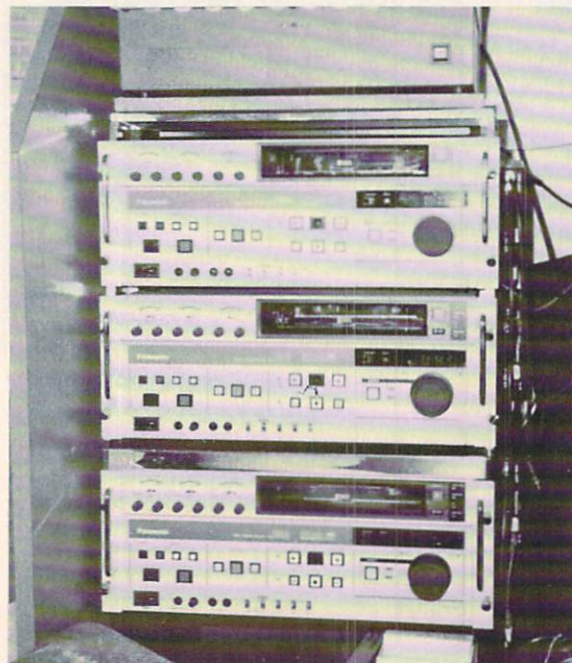
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The Haitex X-Specs 3D glasses were hooked up to an Amiga 2000 running a space arcade game. The glasses aren't the blue/red glasses used for 3D comic



Three of the video tape recorders hooked into the V-LAN.

books. These glasses are connected to and controlled by the Amiga. Shutters covering the lenses open and close in sync with on-screen images. When the left shutter closes, the right shutter opens, and the screen displays an image. The left shutter then opens, the right shutter closes, and another image is displayed on the screen. The shutters open and close rapidly, and, in combination with the changes on the display, gives a 3D appearance.

RGB also announced that they are working on a Super-VHS Desktop Video Workstation using an Amiga 500 and an Amiga 2000. The Amiga 500 is used as a character generator, and the Amiga 2000 is used as master controller of the editing process. The combination of the Super-VHS format and the Amiga's capabilities packs quite a punch!

The Amigas are hooked into a video local area network using equipment from Videomedia. Videomedia's V-LAN product uses a VSIO converter to convert RS-232 data to data V-LAN can understand. VSIO receivers convert V-LAN data to fit the remote device. Receivers can be daisy-chained, and up to 32 devices can be on the V-LAN.

RGB showed AmigaLink, a program that controls all the devices through an Intuition interface, sending messages through the Amiga's RS-232 port. AmigaLink provides frame accurate A/B roll editing capabilities which allows you to control two video sources and mix them. The AmigaLink software ran on an Amiga 2000 at the show and mixed video images from an Amiga 500 with video animation from an Amiga 1000. Titling characters generated with the A500 were mixed with A1000 output from Hash Enterprises' Animation: Apprentice. The AmigaLink software is still under development, but from what was shown, it promises to be a good product.

Rod Molina, also of RGB, showed the Mimetics FrameBuffer in action. The FrameBuffer was installed in the A2000, and according to Bob Gilbert, it was one of only two available so far. (LucasFilm has the other framebuffer.) It can capture and display an NTSC broadcast quality image with over 2 million colors. The FrameBuffer can also display images from programs like Sculpt-3D that output image files with a greater number of colors than a standard Amiga can display.

Bob Gilbert also said he has spoken to the people at AmiExpo about getting a show put together for the Orlando area. Bob is also trying to organize a network of dealers in Florida, so they can team up and get better software and hardware discounts to be passed on to their customers.

As you can see, there are great things going on in Florida! Be on the lookout for more good things to come!

•AC•

GAMES EDITION

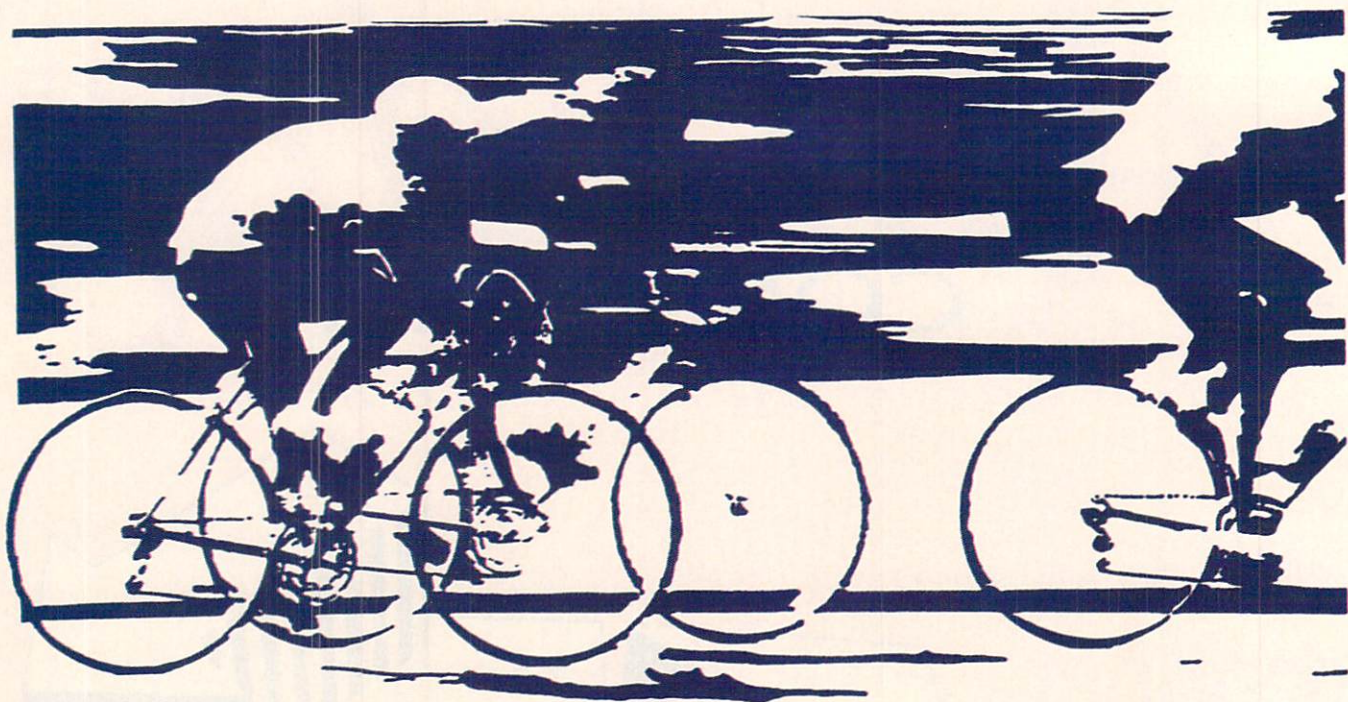
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Amiga Product Guide

Games Edition

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Amazing Computing™ provides this guide as a compilation of products from all companies who have responded to our multiple requests for information. The descriptions have been adapted directly from the information supplied by developers. Accordingly, the listings are not intended as reviews, but rather as information for active users in the ever-growing Amiga market. AC™ will not be held responsible for omissions or errors (including prices). If you detect any errors or omissions, please let us know, in writing, as soon as possible. —Ed.

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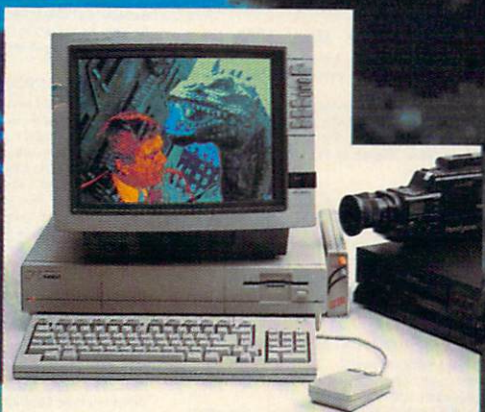
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From the Beginning

Since February 1986, *Amazing Computing™* has been providing users with complete information for their Amiga. This storehouse of programs and information is still available through our back issues. From the Premiere issue to the present, there are insights into the Amiga any user will find useful. AC was the first magazine to document CLI, tell its readers how to connect a 5 1/4 IBM drive, describe a 1 meg upgrade hardware project for the A1000, and many more. Please read the list of topics AC has covered below to find the information you have been missing.

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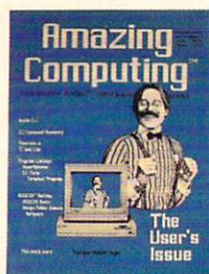
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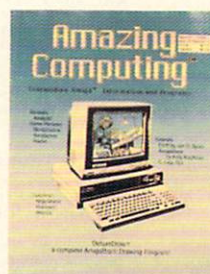
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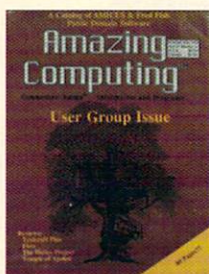
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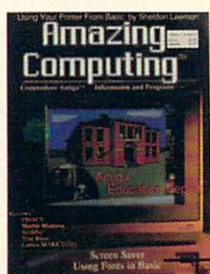
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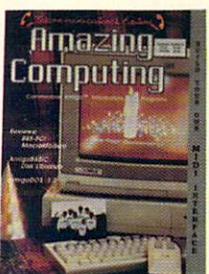
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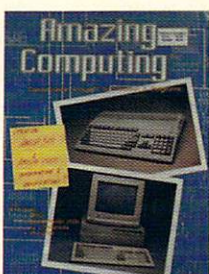
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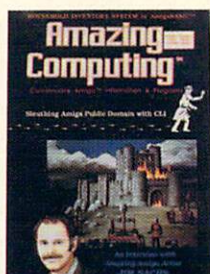
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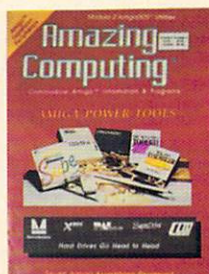
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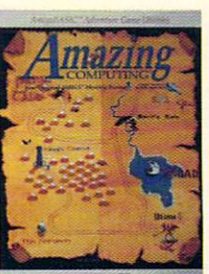
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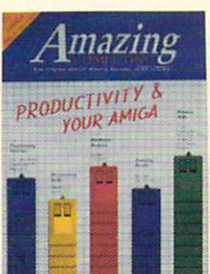
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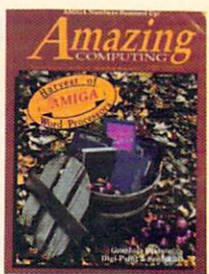
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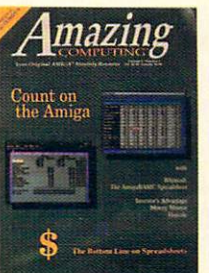
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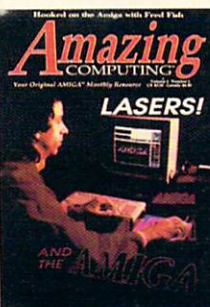
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SDI, Earl Weaver Baseball, Portal, The Surgeon, Little Computer
People, Sirobad, StarGlider, King's Quest (I, II and III), Fairy Tale
Adventure, Ultima III, Facets of Adventure, Video Vegas and
Bard's Tale.

Plus Amazing monthly columns... Amiga Notes, Roomers,
Module-2, 68000 Assembly Language and The Amiga Network.
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Accolade
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1> by Rich Falconburg

The COMMAND LINE

A Continuing Guide to the CLI

Our discussion so far has concentrated on interactive use of AmigaDOS. We've seen that command files will permit us to enter commands unattended. This type of operation is known as a batch process. The EXECUTE command makes this possible and is perhaps the most powerful function of AmigaDOS. In its simplest form, you provide the name of the script file to execute.

1> EXECUTE startup-sequence

What's this? No path? And I didn't even set my default to the S/ directory first. EXECUTE will first check your default directory and then the S/ directory for a file of the name provided. It's a good idea to place all of your batch files here. EXECUTE then reads the file and executes each command it finds in sequence. This in itself is not all that impressive. What makes EXECUTE so useful is the Batch execution control commands and modifiers that it recognizes. The default startup-sequence shows one—the IF command. The IF command provides for flexible decision branching with any of the following:

```
IF EXISTS name
IF <parm> EQ ""
IF WARN
IF ERROR
IF FAIL
ELSE
ENDIF
```

The first option enables us to determine if a specific file or directory exists. The complete path may be specified. The second option will compare the equality

of two text strings. These may be batch file parameters and text strings in varied combinations. The next three permit testing for several levels of command failure. The ELSE command facilitates further decision branching based on the initial IF test. ENDIF closes the if test block. Each of the IF modifiers may be used with NOT to invert the logic of the test. Let's examine these more closely.

Are You There?

The EXISTS option can be useful to determine if a particular volume or directory is mounted and then to set up certain operations accordingly. Here is an example for checking for different disks containing programs I want to run. If this is inserted in the startup-sequence it will provide a type of selective startup (albeit not a very elegant one) based on the volumes mounted. This is really only useful for those with more than one floppy disk drive.

```
IF EXISTS WordProcessing:
  CD WordProcessing:
  ASSIGN Docs: WordProcessing:Documents
  RUN wp
ENDIF
IF EXISTS DataBase:
  CD DataBase:
  RUN db
ENDIF
IF EXISTS Graphics:
  CD Graphics:
  ASSIGN PICS: Graphics:Pictures
  ASSIGN BRUSHES: Graphics:Brushes
  RUN Paint
ENDIF
```

The names that follow the EXISTS command are the Volume names of the disks. In each case, if the test is true (the volume is mounted) each command preceding the ENDIF will be executed. If

the condition is false, AmigaDOS pops up a requestor asking you to insert that volume. Click on cancel and control is passed directly to the matching ENDIF of that block (IF and ENDIF must always be paired), and the lines between are ignored. If you own several drives, and more than one qualifying volume is present, you'd better have enough memory, because each program will be started. This may or may not be preferential. Should you want to prevent this from occurring, it's possible to avoid executing that code by using two other commands—SKIP and LAB. Add this line to the bottom of the previous example:

LAB Continue

Now add this line before each line containing the ENDIF:

SKIP Continue

The LAB command establishes a label within the Batch file that may be jumped to using the SKIP command. Unfortunately, SKIP will only jump forward in the file. I'll cover a workaround for this later. Each may be used with or without the defining name. If a name is given, SKIP will proceed directly to the line with the matching LAB. If the name is omitted, SKIP will jump to the first unnamed LAB. If SKIP is provided with a non-existent label, the Batch file informs you with a message and terminates.

The RUN command demonstrates another feature of AmigaDOS. When a program is RUN, it will not tie up the current CLI process. Normally, entering the program name followed by a

(continued)

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RETURN keeps the CLI process busy. Using RUN permits AmigaDOS to open a new CLI process in the "background" and start the program there. I use RUN here to allow the Batch file to continue execution. This is one place where the RunBackground command mentioned last issue is beneficial. In most cases, implementing the RB command prevents a process's console window from closing. This means that if you use the example above in a startup-sequence and one of the volumes is present, the AmigaDOS console window used by the startup-sequence will not close until you exit the program on that volume. The "ENDCLI >NIL:" at the end of the startup-sequence file will be executed, which informs AmigaDOS to remove this CLI process from the system. That process will no longer accept input, but the window hangs around cluttering up things. RunBackground eliminates this problem (Thanks Rob!).

The ASSIGN command is used to establish a logical name for just about anything. I'll cover it in detail when we get to devices. Here it is used to simplify access to a directory.

That Does Not Compute!

There are times when it's necessary to check for unexpected conditions. Most commands and some programs will provide evidence of a problem by issuing a return code. This code is an integer greater than zero that will indicate the severity of the failure. We can test for this condition with the IF command using the keywords described earlier. The return codes for each are:

WARN - equal to or greater than 5
ERROR - equal to or greater than 10
FAIL - equal to or greater than 20

Any return code greater than 9 will cause the Batch file to terminate. Obviously, the purpose of error trapping is to prevent this from happening. To check for codes greater than 9 we must first change the level at which a terminating failure occurs. This is done with the FAILAT command and must be issued before each command we wish to test.

```
FAILAT 15
IF NOT ERROR
  TYPE Instructions
ELSE
  SKIP Cleanup
ENDIF

FAILAT 25
RUN DemoProg
IF FAIL
  ECHO "We have a problem"
  QUIT 30
ENDIF
```

The first example will TYPE the file "Instructions" if all's well, but will cause execution to jump to the label "Cleanup" if it detects a return code equal to or greater than 10. If the return code is equal to or greater than 15, the batch file will terminate. The second example will cause the batch file to purposely terminate if there is a return code equal to or greater than 20. The QUIT command forces the termination and provides our own return code (30) to flag the error. This is helpful in long or complicated scripts. The number is not required, but if it's supplied it must always be greater than the FAILAT level or it will not be displayed. This particular example will cause the message "quit failed returncode 30" to be displayed.

Use values with QUIT that are meaningful to you. In the event of a problem, you can determine where the batch file failed. The ECHO command prints a text string to the console window.

Pass the Parameter Please

A significant feature of the EXECUTE command is its ability to use "parameter substitution." This means that variables may be used to carry information to be substituted for different operations. The option that provides this is

```
.KEY parameter/
condition,parameter/condition...
```

and MUST be the first line beginning at the first column in the script file. Multiple parameters are separated by a comma.

IMPORTANT!! Do not place spaces between commas and parameters in the .KEY statement. The results are unpredictable.

The dot (.) informs AmigaDOS that this batch file contains parameter substitutions. The file is read, and a copy of the script file with the values substituted is placed in the T/ directory and executed. The parameter is a name you provide, and may be used elsewhere in the script for comparisons and messages by placing it between brackets. Initially, the brackets are set to the "less than" (<) and "greater than" (>) signs. Since these are special characters recognized by EXECUTE, it's possible to use parameters in messages. For example:

```
ECHO "The file <file> does not exist."
```

As a result, the ECHO command will not be able to display the two bracket characters. If this is a problem, it's easy to change the brackets to something else using the following "dot" commands:

```
.BRA (
.KET )
```

The "condition" value may be either /a or /k. The /a indicates a required parameter to be provided when the script is executed. If omitted the message "EXECUTE: Parameters unsuitable for key

'parameter/a'" will be displayed. The name of the parameter is not required when executing the file if the values are given in the proper order. The /k condition states that if the parameter value is supplied, the name defined in the .KEY statement must be entered, followed by the value. For example, if you set up a batch file called SortIt with this statement:

```
.KEY TextFile/a,SortName/k
```

The command entered should be something like:

```
1> EXECUTE SortIt df1:Customers.txt
or
1> EXECUTE SortIt df1:Customers.txt
SORTNAME df0:Cust.srt
```

When the script is executed, the name "Customers.txt" will be substituted for every occurrence of the parameter "TextFile", and the name "Cust.srt" will be substituted for the parameter "SortName."

Here is a short batch file I wrote to provide a HELP facility from the CLI. It

shows the potential of simple parameter passing. The semicolon (;) is the AmigaDOS comment character. Anything placed on the line after it will be ignored by the EXECUTE command.

```
.KEY command
.BRA {
.KET }

;      —=== AmigaDOS HELP Facility ===—
;
; Written by: Rich Falconburg
;
; This command file requires that a descriptive
; text file
; for each AmigaDOS command be placed in
; the HELPLIB
; directory. The name of the file is the same as
; that of
; the command.
;

IF "{command}" EQ ""
    TYPE HELPLIB:Commands.hlp
ELSE
    IF EXISTS HELPLIB:{command}
        TYPE HELPLIB:{command}
    ELSE
        ECHO "Sorry, no HELP for '{command}'"
        EXECUTE S:HELP
    ENDIF
ENDIF
```

This file demonstrates the equality comparison option of the IF command. Here it's used to determine if the "command" parameter contains a value, and if it doesn't, to display a list of the AmigaDOS commands (HELPLIB:Commands.hlp). If "command" is not empty, it then checks the HELPLIB directory for a file of the same name as the one supplied. If found, the file is displayed with the TYPE command. If the supplied name is not found, an error message is displayed and the HELP script file is executed without a parameter, thereby causing a display of the list of commands.

This last step is a simple form of the SKIP workaround that I mentioned. You could extend this by defining a parameter in the .KEY statement and using SKIP with parameter substitution.

Here is a script file named TESTEX that demonstrates this.

(continued)

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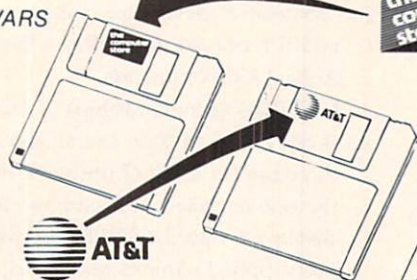
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use either method for each parameter
defined in the .KEY statement.

This example brings up an important
point. It's possible to execute a batch file
from another batch file. A good place for
this is in the startup. If you own a hard
drive, you may wish to perform some of
the boot operations simultaneously. I
have chosen to use a separate file to
mount most of the partitions. I run the
EXECUTE command on a new batch file
that will perform the mounts and not
hold up the rest of the startup. Here is an
excerpt from a file named Mounts.stu.

```
cd SYS:
Mount DH1:
diskchange DH1:
ECHO " DH1: Mounted as PUBLISH:"
Mount DH2:
diskchange DH2:
ECHO " DH2: Mounted as DATABASE:"
MOUNT DH9:
Diskchange DH9:
Endcli > nil:
```

I'm kind of getting ahead of myself here,
but I always prefer "real world" ex-
amples. The MOUNT command informs
AmigaDOS of a new device in the
system. I'll cover it in greater detail next
issue. DISKCHANGE informs the system
that a new disk has been placed in the
given device. Normally this command is
used for an external 5 1/4" disk drive. In
this situation, it's used to make the
volume visible to the Workbench and
user. This batch file demonstrates one
way of distributing the load in the system
during startup. You will need to experi-
ment to see what can be done to speed
up your startup. If you have programs
that need special setups before they run,
try creating a script to make it easier.

There is much more that can be accom-
plished using the parameters and
decision logic available with EXECUTE.
This has only been an introduction to the
basics. Next issue we'll look at device
manipulation and the often confusing
mountlist file. I'll also shed some light on
the mystery of the ASSIGN command
and how to use it effectively.

•AC•

.KEY label/k
.BRA (
.KET)

SKIP (label\$ONE)

LAB ONE
ECHO "This is label ONE.\ "
EXECUTE TESTEX LABEL TWO

LAB TWO
ECHO "This is label TWO.\ "
EXECUTE TESTEX LABEL THREE

LAB THREE
ECHO "This is label THREE.\ "
EXECUTE TESTEX LABEL FOUR

LAB FOUR
ECHO "This is label FOUR.\ "
ECHO "End of testex\ "
QUIT

ter for the delimiter, use the dot com-
mand .DOLLAR to change it.

DOLLAR I
or
.DOLLAR \

In the example above, the SKIP com-
mand will have the label "ONE" if none
is provided when first executed. Without
a valid value for SKIP, an error message
is generated. I could have used:

```
IF "(label)" EQ ""
EXECUTE TESTEX LABEL ONE
ENDIF
```

It works but adds an unnecessary loop
(this thing goes in circles enough
already!). A single default definition can
be established with the .DEF option.
Place it right after the .KEY statement as:

```
.DEF label ONE
```

This sets a global default for the batch
file to the parameter "label." You may

Always clouding the issue, huh? The
"\$ONE" next to the parameter for the
SKIP command is a single substitution
default value. That is, if no value for the
parameter is given, the default value is
used. The "dollar sign" is a separator
symbol. If you prefer a different charac-



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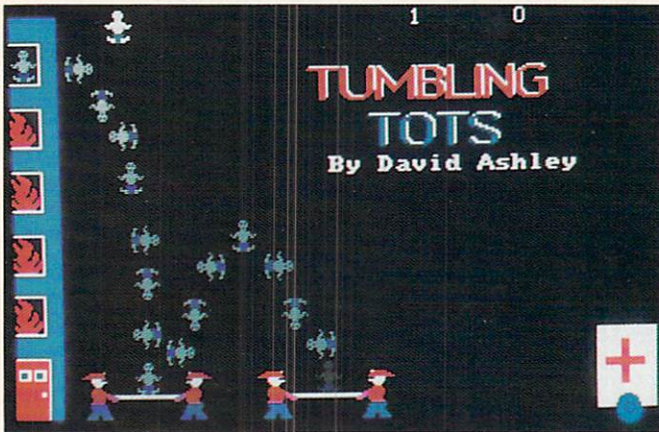
Tumblin' Tots

Rescue bouncing babies in an assembly language game you can program.

by David Ashley

In this article, I will present a game written completely in assembly language. The game is *Tumbling Tots*. The object of the game is to position two firemen carrying a trampoline under a hapless baby as it falls from a three story building. The more babies your firemen save, the more points you accumulate. There are three places for the firemen to stand. Hitting number pad keys 1, 2, and 3 maneuvers them to the left, middle, and right positions, respectively. The game gets pretty hectic when several babies are falling at once.

The program demonstrates many of the Amiga's features: low-res 320 x 200 graphics, sound effects, blitter operations, intuition windows and keyboard events. The game can be made resident, is re-entrant, and works with extended memory. Moreover, the code is completely address independent. It is also fully compatible with the Amiga's windowing environment.



On entry, the game is in demo mode. The firemen move automatically to protect waves of babies. Hit any digit (not on the number pad) to begin play at a specific wave. Press the space bar to begin play at wave number one. As the waves get higher, more babies are present at the same time, which makes play more difficult. In the play mode, number pad keys 1, 2, and 3 move the firemen to the left, middle and right, while keys 4 and 6 move them in incremental steps left and right for more challenging play. Each baby must be bounced three times to be saved in the red-cross truck on the right. You need timing and good judgement to keep the firemen under the babies at the right times.

For every baby you miss, you lose an extra baby. (Extras are displayed on the top left part of the screen.) You are allowed five misses before the game ends. When a baby hits the pavement, you'll hear a grisly splat which might make you feel guilty for your error. Every time a baby bounces on the trampoline, the game makes a boink sound.

Inner workings of the game

For timing, the game uses the graphics.library function `WaitTOFO`. This syncs to the display, and is a good, commonly used timing function. A variable called "speed" specifies the number of fields to wait before moving the babies. It is normally 6, which means the babies are moved every 6/60ths of a second, or 1/10th. Lowering "speed" makes play faster.

The game behaves differently depending on whether you're in the demo mode or play mode. In the demo mode, the firemen are moved by the semi-intelligent computer

player. That "player" looks ahead to when the next baby will have to be bounced. In the play mode, the firemen are moved by keyboard events. There is no sound in demo mode, and the babies are handled differently to make a more interesting display.

There are 26 positions for a baby to be displayed on the screen. These positions are in the "locs" table. A variable "state" specifies which positions babies occupy. It is a long word, and bits that are one mean a baby is to be displayed there. To move the babies, this register is shifted and the display is updated to reflect the new state. Only changes from a one to a zero or vice-versa are done. For example, in order to move three babies in a row, paint a new baby and erase the old baby.

There is a 64 bit word composed of long words "cycle1" and "cycle2" representing an entire baby cycle. To set up for a cycle, this register is cleared and a number of bits equivalent to the wave number are turned on. The 64 bit register gets shifted into "state", the visible portion, and the babies are moved.

Since randomly putting ones in "cycle1" and "cycle2" could result in impossible situations where the firemen would have to be in two places at once, the game checks to make sure such events don't happen by looking for one bits in positions 6, 8, and 14 bits to the left and right of each new bit. If any of these bits is a one, the sequence will be impossible. These numbers arise from the number of positions between the left and middle, middle and right, and left and right bounce positions.

In play mode, a cycle with as many bits on as the wave number is created. When the last bit is shifted out of "state", a new cycle is created. Demo mode is different in that instead of separate complete cycles, there is a constant supply of babies. So, there are always "maxbabies" babies in the total cycle. When a baby is saved, another is placed in the 64 bit word to replace him.

All figures are painted and erased with the blitter. I found it easier and more convenient to write to the blitter's registers directly, rather than using the higher level functions the graphics library provides. The blitter is locked using the OwnBlitterO and DisOwnBlitterO functions.

The audio device is opened to allow the Amiga's audio channels to make the bounce sound. The first command sent to the device is an allocate, which will return any of the four channels prepared for use (if any is available). To make a sound, the period and the volume, the waveform's location and length, and the number of cycles to play the sound are specified in a cmd_write. The frequency is raised with further adcmd_pervol commands to make a chirp. If a sound is being made and another is pending, the first sound is aborted.

For variable storage, the program takes memory from its stack with the LINK command. This puts the variable base in register A5. Variables are then accessed as negative offsets. The offsets are set up with the NDS macro, which is given its variable name

and its size. Each new variable subtracts the size from the "soffset" counter and is equated to the new value of "soffset". This is a good way to get variable storage space, since the stack is free memory provided just for such use. Moreover, all of the 68000's addressing modes can be used.

An alternative is to put dc's and ds's at the end of the program and use program space for storage, but this has drawbacks. The storage area adds to the program's size, and not all variables have to be initialized. More important, they must be accessed with the absolute long addressing mode, which forces RELOC32's to be added to the load module. Each access takes up four bytes for a reference, whereas the "variable(a5)" takes up only two. In addition, two tasks cannot be running the same section of code, because their variables would collide.

The images were created with Dpaint and stored as brushes, which were then converted to hex with a program like ilbmdump on Fred Fish 16, the IFF disk.

As a final note, the program must be assembled with upper and lower case being equivalent. This can be done with the 'C' option in the Metacomco assembler.

Listing One: Tumbling Tots.asm

```
;Tumbling Tots written 1987 by David Ashley
;Must be assembled with upper case <==> lower case
;tabs at 10,8,20
hardware: equ    $dff000          ;hardware registers
depth:    equ     3                ;number of bitplanes
nomcols:  equ     8                ;total # of colors
extrax:   equ     50               ;x of extra men
extray:   equ     15               ;y
distance: equ     20               ;dots between extras
scorex:   equ     250              ;x of score
scorey:   equ     15               ;y
speed:    equ     6                ;1/60s between cycles
maxbabs:  equ     8                ;max on screen ever
titlex:   equ     150              ;x of title
titley:   equ     40               ;y
men1x:    equ     34               ;x of left firemen
men2x:    equ     124              ;x of middle firemen
men3x:    equ     214              ;x of right firemen
meny:     equ     175              ;y
splaty:   equ     meny+17          ;y of splat
namex:    equ     160              ;x of name
namey:    equ     80               ;y
truckx:   equ     290              ;x of truck
trucky:   equ     157              ;y
buildx:   equ     0                ;x of building
buildy:   equ     18               ;y

ifnd      exec_types_i
include   "exec/types.i"
include   "exec/memory.i"
include   "intuition/intuition.i"
include   "libraries/dosextens.i"
include   "workbench/workbench.i"
include   "workbench/startup.i"
include   "devices/audio.i"
include   "hardware/custom.i"
include   "lvo.i" ;this has the _LVO definitions
           ; if you have it, you will
           ; not need amiga.lib
endif

endc

link      a5,#workspce            ;get variable storage
move.l    4.w,execbase(a5)        ;save execbase
move.l    4.w,a6                  ;set up for exec calls
suba.l    a1,a1                   ;no name
jsr       _lvofindtask(a6)         ;find task block
move.l    d0,mytask(a5)           ;save
lea        intname(pc),a1          ;open up intuition
moveq     #0,d0
jsr       _lvoopenlibrary(a6)
```

(continued)


```

move.l d0,intbase(a5)
lea gfxname(pc),a1 ;open up graphics
moveq #0,d0
jsr _lvoopenlibrary(a6)
move.l d0,gfxbase(a5)
lea dosnam(pc),a1 ;open up dos
moveq #0,d0
jsr _lvoopenlibrary(a6)
move.l d0,dosbase(a5)

clr.l returnmsg(a5) ;clear returnmsg
move.l mytask(a5),a4 ;get process block
tst.l pr_cli(a4) ;test if from CLI
bne.s nowb ;if ne,from CLI
lea pr_msgport(a4),a0 ;get msgport
jsr _lvwaitport(a6) ;wait for WB message
lea pr_msgport(a4),a0
jsr _lvogetmsg(a6) ;get message
move.l d0,returnmsg(a5) ;save
move.l d0,a4
move.l sm_arglist(a4),d0 ;just in case flaky
beq.s nowb ;should never happen
move.l d0,a4
move.l wa_lock(a4),d1 ;get lock on directory
move.l dosbase(a5),a6 ;setup for dos calls
jsr _lvocurrentdir(a6) ;change current dir

nowb: bsr.s tots ;call main routine

move.l 4,w,a6 ;setup for exec calls
move.l returnmsg(a5),d4 ;get returnmsg
beq.s nowb2 ;if eq,am from CLI
jsr _lvoforbid(a6) ;otherwise forbid
move.l d4,a1
jsr _lvoreplymsg(a6) ;send back to WB
nowb2: move.l dosbase(a5),a1
jsr _lvocloselibrary(a6) ;close dos
move.l gfxbase(a5),a1
jsr _lvocloselibrary(a6) ;close graphics
move.l intbase(a5),a1
jsr _lvocloselibrary(a6) ;close intuition
unlk a5 ;release variables
rts ;return

tots: lea datastart(pc),a1 ;get base of data
move.l execbase(a5),a6 ;set up for execs
jsr _lvotypeofmem(a6) ;see what type
moveq #memf_chip,d1
and.l d0,d1
beq.s notchip ;is it CHIP?
lea datastart(pc),a1 ;if so,all ok
move.l a1,memory(a5) ;data area
clr.l allocated(a5) ;didn't allocate
bra.s inchip ;skip next stuff
notchip: move.l #dataend-datastart,d0
moveq #memf_chip,d1
jsr _lvallocmem(a6) ;get some CHIP mem
move.l d0,memory(a5) ;data area
move.l d0,allocated(a5) ;did allocate
beq nomem ;exit if can't get it
move.l d0,a1
lea datastart(pc),a0
move #dataend-datastart)/2,d0
copymem: move (a0)+,(a1)+ ;copy data to CHIP
subq #1,d0
bne.s copymem
inchip: lea nscreen(pc),a0
move.l intbase(a5),a6 ;setup for int. calls
jsr _lvopenscreen(a6) ;open up our screen
move.l d0,babyscreen(a5) ;save
beq noscreen ;exit if can't open
lea nwindow+nw_screen(pc),a0
move.l d0,(a0) ;put in screen
move.l d0,a0 ;in nwindow struct
lea sc_bitmap+bm_planes(a0),a1
move.l a1,myplanes(a5) ;save bitplanes

lea nwindow(pc),a0
jsr _lvopenwindow(a6) ;open our window
move.l d0,babywindow(a5) ;save
beq nowindow ;exit if can't open
move.l d0,a0
move.l wd_userport(a0),uport(a5) ;our IDCMP port

lea soundio(a5),a0
moveq #ioa_sizeof,d0
bsr clearmem ;clear out IO block
lea soundport(a5),a0
moveq #mp_size,d0
bsr clearmem ;clear out msgport

lea audname(pc),a0
lea soundio(a5),a1
moveq #0,d0
moveq #0,d1
move.l execbase(a5),a6

```

```

jsr _lvopendevice(a6) ;open audio device
moveq #-1,d0
jsr _lvallocsignal(a6) ;get a signal bit
lea soundport(a5),a0 ;setting up for audio
clr.l ln_name(a0) ;noname
clr.b ln_pri(a0) ;priority = 0
move.b #nt_msgport,ln_type(a0)
move.b #pa_signal,mp_flags(a0)
move.b d0,mp_sigbit(a0) ;put in signal bit
move.l mytask(a5),mp_sigtask(a0)
move.l a0,(a0) ;initialize header
addq.l #lh_tail,(a0)
clr.l lh_tail(a0)
move.l a0,lh_tailpred(a0)
lea soundio(a5),a1 ;prepare for allocate
move.l a0,mn_replyport(a1)
move #adcmd_allocate,io_command(a1)
lea audiomap(pc),a0 ;map for which channels
move.l a0,ioa_data(a1)
moveq #4,d0 ;four elements
move.l d0,ioa_length(a1)
move.b #adiof_nowait,io_flags(a1)
move.l io_device(a1),a6
jsr dev_beginio(a6) ;try to allocate
tst.l d0 ;ignore if failure
bne error
lea soundio(a5),a0
lea io2(a5),a1 ;copy stuff to io2
move.l io_device(a0),io_device(a1)
move ioa_allocate(a0),ioa_allocate(a1)
move.l mn_replyport(a0),mn_replyport(a1)
move.l io_unit(a0),io_unit(a1)

move.l babyscreen(a5),a0 ;get our screen
lea sc_viewport(a0),a0 ;get our viewport
lea ctable(pc),a1 ;out new colortable
moveq #nomcols,d0
move.l gfxbase(a5),a6
jsr _lvoadrqb4(a6) ;load new colortable
bsr clearops ;clear blitter ops
move.b #sda,seed(a5) ;random seed
clr.l state(a5) ;clear 32 baby bits
move #meny,d1 ;setup for firemen
move #menlx,d0
move d0,place(a5) ;men are on left
moveq #0,d2
bsr figure ;put men
bsr doops ;do blitter operations
moveq #100,d4
random: bsr rnd ;toss 100 random #'s
subq #1,d4
bne.s random
move #truckx,d0 ;setup for truck
move #trucky,d1
moveq #18,d2
bsr figure ;put truck
bsr doops ;do blits
moveq #buildx,d0 ;setup for building
move #buildy,d1
moveq #19,d2
bsr figure ;put building
bsr doops ;do blits
move #5,babies(a5) ;5 extra babies
move #1,wave(a5) ;wave 1
clr saved(a5) ;saved = 0
restart2: move #1,attract(a5) ;game in attract mode
move #titlex,d0 ;set up for title
moveq #titley,d1
moveq #15,d2
bsr figure ;put title
bsr doops ;do blits
move #namex,d0 ;setup for name
moveq #namey,d1
moveq #17,d2
bsr figure ;put name
bsr doops ;do blits
restart: moveq #0,d0
bsr update ;update,all babies off
move #splaty,d1 ;clear all splats
move #menlx+24,d0
moveq #16,d2 ;erase splat 1
bsr erase
move #men2x+24,d0 ;erase splat 2
bsr erase
move #men3x+24,d0 ;erase splat 3
bsr erase
bsr doops ;do blits
moveq #extrax,d0 ;set up for extras
moveq #extray,d1
moveq #1,d2
move babies(a5),count(a5) ;temporary counter
subq #1,babies(a5)
extralp: bsr figure ;put extra baby
bsr doops ;do blits
addi #distance,d0 ;move to next extra
subq #1,count(a5) ;decrement count

```



```

bne.s    extralp                :loop back
move     #speed,timer(a5)       :initialize timer
move     #scorex-50,d0          :wavex is scorex - 50
moveeq   #scorey,d1
bsr      clearnum              :blank out wave number
move     wave(a5),d2
move     #scorex-50,d0
moveeq   #scorey,d1
bsr      putnum                :put up wave number
move     #scorex,d0
moveeq   #scorey,d1
bsr      clearnum              :blank out score
move     saved(a5),d2
move     #scorex,d0
moveeq   #scorey,d1
bsr      putnum                :put score
clr.l    cycle1(a5)             :clear 64 baby bits
clr.l    cycle2(a5)
clr      babieson(a5)          :clear display bits
loop:    move.l    gfxbase(a5),a6 :set up for graphics
jsr      _lvwaittof(a6)        :wait for top of field
bsr      what                  :any keyboard activity?
move     code(a5),d0           :get code of last key
tst      attract(a5)           :are we in attract
beq.s     normplay             :if not, behave normally
                                :we are in attract mode
cmpi     #$45,d0              :was it an ESC?
beq      exit                  :if so, exit
tst      d0                    :if 0, no key was hit
beq      atrmode               :continue attract
cmpi     #10,d0                :was it a digit key?
bcc.s     nowavset             :if >=10, was not
move     d0,wave(a5)           :<10, so store in wave
bra.s     waveset              :set which wave
nowavset: cmpi     #$40,d0       :was it space?
bne       atrmode              :if not, ignore and cont
move     #1,wave(a5)           :space means wave 1

waveset:  clr      attract(a5)   :waveset: a game is
clr      saved(a5)             :starting, do setups
move     #5,babies(a5)         :no longer attract mode
move     #titlex,d0            :zero out score
moveeq   #titley,d1            :5 extra babies
moveeq   #15,d2                :set up for title erase
bsr      erase                  :erase title
bsr      doops                 :do blits
move     #namex,d0             :set up for name erase
moveeq   #namey,d1
moveeq   #17,d2
bsr      erase                  :erase name
bsr      doops                 :do blits
bra      restart               :go to restart
atrmode:  bsr      computer      :
normplay: tst      d0
bmi.s     nohit                :ignore negatives
cmpi     #$45,d0               :was it ESC?
beq      exit                  :if so, exit
subi     #51d,d0               :try keypads 123
bcs.s     nohit                :not 123 or 46
cmpi     #3,d0                 :yes, was 123
bcs.s     absolute             :try 46
subi     #510,d0               :not 46
bcs.s     nohit                :if it was a 4
beq.s     tryleft              :is it 6?
cmpi     #2,d0                 :yes
beq.s     tryright             :ignore it otherwise
bra.s     nohit                :try to go left
tryleft:  cmpi     #menlx,place(a5) :already on left side
beq.s     nohit                :not on left, so ok
move     place(a5),d0          :move left one
subi     #90,d0                :continue
bra.s     delta
tryright: cmpi     #men3x,place(a5) :try to go right
beq.s     nohit                :already on right side
move     place(a5),d0          :not on right, ok
addi     #90,d0                :move right one
bra.s     delta                :continue
absolute: mulu     #90,d0       :an absolute, 012x90
addi     #menlx,d0             :add in left man's x
delta:    move     place(a5),d1 :see if any change
cmp      d1,d0
beq.s     nohit                :if same, don't bother
move     d0,place(a5)          :update firemen's place
move     d1,d0                :set up to erase old
move     #meny,d1
moveeq   #0,d2                 :figure 0 is firemen
bsr      erase                  :erase old
move     place(a5),d0          :set up for new
bsr      figure                :put new
bsr      doops                 :do blits
nohit:    bsr      sndchnge      :perhaps change sound
subq     #1,timer(a5)          :subtract 1 from timer
bne      loop                  :if not 0, no change
                                :in babies
move     #speed,timer(a5)      :restore timer

```

(continued)

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```

tst    attract(a5)      ;are we in attract mode
beq.s  noattr           ;if not, skip
btst   #0, state+3(a5)  ;did a baby make it?
beq.s  nodecbab        ;if not, skip
subq   #1, babieson(a5) ;one fewer in cycle
nodecbab: cmpi   #maxbabs, babieson(a5) ;are there too many?
bcc    ordinary        ;if so, skip
addq   #1, babieson(a5) ;we will add one
move.l cycle1(a5), d4
move.l cycle2(a5), d5
moveq  #1, d6          ;add only one baby
bra.s  pickloop        ;go and pick one
noattr: tst.l   cycle1(a5) ;are there more?
bne.s  ordinary        ;yes, keep going
tst.l  cycle2(a5)      ;are there more?
bne.s  ordinary        ;yes, keep going
;we are all out
tst.l  state(a5)       ;are we in demo?
bne.s  ordinary        ;if so, keep going
;following code:
; d4 and d5 are
; a 64 bit word
; which represents
; the baby cycle
; always first baby here
moveq  #1, d5          ;clear out upper 32
moveq  #0, d4          ;how many babies to put
waveput: subq   #1, d6 ;sub one from counter
beq.s  cymcade         ;if zero, we are done
pickloop: bsr    rnd     ;get a random number
andi   #3f, d0         ;make 0-3
tst    attract(a5)     ;if attract, confine
; to >14
; not attract, so skip
beq.s  under14         ;if <14, try again
cmpli  #14, d0         ;which 32 bits?
under14: bcs.s  pickloop ;<32 means d5
cmpli  #32, d0         ;otherwise, check d4
bcs.s  inlow32
btst   d0, d4
bra.s  inhigh32
inlow32: btst   d0, d5 ;check d5
inhigh32: bne.s pickloop ;a one bit means baby
;the following code checks for an impossible baby
;situation, where the firemen would have to be in two
;places at once
lea    bitlocs(pc), a0 ;prepare for check
moveq  #6, d2          ;there are 6 possible
moveq  #0, d3          ;collision count = 0
bitcheck: move   d0, d1
add.b  (a0)+, d1       ;bit # + offset = test
cmpli.b #64, d1        ;off scale?
bcc    noincr          ;yes, don't check
cmpli.b #32, d1        ;which 32 bits?
bcs.s  low32           ;<32 means low 32
btst   d1, d4          ;otherwise check upper
bra.s  high32
low32: btst   d1, d5 ;check d5
high32: beq.s noincr   ;a zero bit means empty
addq   #1, d3          ;a collision: incr count
noincr: subq   #1, d2 ;any checks left?
bne.s  bitcheck        ;if so, continue
tst    d3              ;must be zero for ok
bne.s  pickloop        ;if >0, try again
cmpli  #32, d0         ;which 32 bits?
bcs.s  low32set        ;if <32, low 32
bset   d0, d4          ;otherwise, put in high
bra.s  hig32set
low32set: bset   d0, d5 ;put in low
hig32set: bra.s waveput ;continue with loop
cymcade: move.l d4, cycle1(a5) ;we are all done
move.l  d5, cycle2(a5) ;store the cycle
ordinary: moveq  #0, d0 ;now comes updating
roxr   #1, d0          ;clear extend flag
roxr   cycle1(a5)      ;shift entire cycle
roxr   cycle1+2(a5)    ;one bit right in time
roxr   cycle2(a5)
roxr   cycle2+2(a5)
move.l state(a5), d0 ;now shift into visible
roxr.l #1, d0
moveq  #16, d1         ;place for first bounce
btst   d1, d0          ;any baby there?
beq.s  nol             ;if bit is 0, none
moveq  #men1x, d2      ;where men should be
cmp    place(a5), d2   ;compare with place
beq.s  bounce1         ;good! a bounced baby
cmp    old(a5), d2     ;compare with last
beq.s  bounce1         ;last is good too
bclr   d1, d0          ;player lost one
bsr    death           ;baby is paste
bra.s  nol             ;don't make sound
bounce1: bsr    sound   ;make a bounce sound
nol:    moveq  #8, d1 ;second bounce place
btst   d1, d0          ;any baby there?
beq.s  nol             ;none, so skip
move   #men2x, d2      ;where men should be
cmp    place(a5), d2   ;are they there?
beq.s  bounce2         ;yes, baby got bounced

```

```

cmp    old(a5), d2     ;were they there?
beq.s  bounce2         ;yes, baby bounced
bclr   d1, d0          ;clear baby bit
bsr    death           ;kill baby
bra.s  nol             ;skip sound
bounce2: bsr    sound   ;make a bounce sound
nol:    moveq  #2, d1 ;last place for baby
btst   d1, d0          ;is baby there?
beq.s  nol             ;if no, skip
move   #men3x, d2      ;men should be
cmp    place(a5), d2   ;are they here?
beq.s  bounce3         ;yes, baby bounced
cmp    old(a5), d2     ;were they there?
beq.s  bounce3         ;yes, baby bounced
bclr   d1, d0          ;clear baby
bsr    death           ;kill baby
bra.s  nol             ;no sound
bounce3: bsr    sound   ;make bounce sound
nol:    bsr    update  ;update display
move   place(a5), old(a5) ;old = place
btst   #0, state+3(a5) ;did a baby make it?
beq    loop            ;no, continue
tst    attract(a5)     ;are we in attract mode
bne    loop            ;if so, continue
addq   #1, saved(a5), d2 ;another baby saved
move   saved(a5), d2   ;prepare to show score
move   #scorex, d0
moveq  #scorey, d1
bsr    putnum          ;put up score
;this next check is to see if we are in a new wave.
;wavelens is a table of the changeover points for
;new waves
move   wave(a5), d0    ;see if in new wave
lea    wavelens-2(pc), a0
adda   d0, a0
adda   d0, a0
move   (a0), d0        ;get count for next
cmp    saved(a5), d0    ;are we far enough?
bcc    loop            ;not far enough
addq   #1, wave(a5)    ;we are in new wave
move   wave(a5), d2    ;prepare to show wave
move   #scorex-50, d0
moveq  #scorey, d1
bsr    putnum          ;put new wave number
bra    loop            ;continue
exit:   move.l  execbase(a5), a6 ;game over, close up
lea    soundio(a5), a1
jsr    _lvoclosedevice(a6) ;close audio device
move.b soundport+mp_sigbit(a5), d0
jsr    _lvofreesignal(a6) ;free signal bit
move.l babywindow(a5), a0 ;get our window
move.l intbase(a5), a6
jsr    _lvoclosedevice(a6) ;close our window
nowindow: move.l babyscreen(a5), a0 ;get our screen
move.l intbase(a5), a6
jsr    _lvoclosedevice(a6) ;close our screen
noscreen: move.l allocated(a5), d1 ;free CHIP mem if there
beq.s  nomem           ;zero means didn't get
move.l d1, a1
move.l #dataend-datastart, d0 ;size of it
move.l execbase(a5), a6
jsr    _lvofreemem(a6) ;free it
nomem: rts             ;finally return
;this handles a baby's death. Put a splat and
;decrement extra babies, perhaps end game
;enters with d2 the X to put the splat
;d0 is the visible portion of the cycle, so preserve it
death: move.l  d0, -(a7) ;set up for splat
move    d2, d0
addi    #24, d0
move    #splaty, d1
moveq   #16, d2
bsr     figure         ;put splat
bsr     doops          ;do blits
move    babies(a5), d1 ;get # of babies
beq     toobad         ;if zero, game over
subq    #1, babies(a5) ;one fewer
mulu    #distance, d1  ;compute where to erase
moveq   #extrax, d0
add     d1, d0
moveq   #extray, d1
moveq   #1, d2
bsr     erase          ;erase an extra baby
bsr     doops          ;do blits
move.l  (a7)+, d0
rts
;the game is over. Do not restore d0 and do not return
;so throw away things on stack
toobad: addq   #8, a7 ;d0 and retad
move    #1, babies(a5)
bra     restart2      ;restart
;this routine puts a number
;d2 is the number, d0=X and d1=Y
;we print it from right to left, dividing by 10
;and printing the remainder
putnum: move   d2, temp(a5) ;put in temp storage
move     #4, count(a5) ;never more than 4

```



```

numberlp: move    temp(a5),d2
           ext.l   d2
           divu    #10,d2           ;divide by 10
                                       ;d2 low 16=result
                                       ;d2 high 16=remainder
                                       ;put back in temp
           move    d2,temp(a5)
           swap    d2
           addq    #5,d2           ;make it a digit
           bsr     figure          ;put it
           bsr     doops          ;do blits
           tst     temp(a5)        ;any more digits?
           beq.s   alldigs         ;if zero, we're done
           subq    #8,d0           ;move left one place
           subq    #1,count(a5)    ;did we print 4 yet?
           bne.s   numberlp       ;if not,continue

alldigs:   rts
;clear out where a number is to be displayed
;d0=X,d1=Y
clearnum:  move    #4,count(a5)
           moveq   #5,d2           ;do 5 just to be sure
           bsr     erase          ;blank out
           bsr     doops          ;do blits
           subq    #8,d0           ;move left one
           subq    #1,count(a5)    ;any left?
           bne.s   clearlp       ;if so, continue
           rts

;This routine updates the visible portion of the cycle.
;It will erase babies where they are turned off,
;and display babies where they are turned on.
;If bits stay the same, nothing is done.
;Enter with d0 the new state
update:    move.l   state(a5),d1   ;get old state
           move.l   d0,state(a5)   ;update state
           eor.l    d0,d1          ;get changing bits
           move.l   d1,changes(a5) ;save in changes
           clr      count(a5)       ;clear counter
           move     count(a5),d2    ;get counter
           move.l   changes(a5),d1  ;get changes
           btst     d2,d1          ;is this bit one?
           beq.s    updated        ;if not, skip
           moveq    #25,d0         ;25-bit is which baby
           move.l   state(a5),d1   ;get new state
           btst     d2,d1          ;see if on or off
           beq.s    babyoff        ;if zero, erase baby
           sub      d2,d0           ;compute 25-bit #
           bsr     putbaby         ;put baby
           bra.s    babydone       ;skip
           sub      d2,d0           ;compute 25-bit #
           bsr     erasbaby        ;erase baby
           bsr     doops          ;do blits
           bsr     doops          ;do blits
           bsr     doops          ;do blits
           addq     #1,count(a5)    ;move to next bit
           cmpi     #26,count(a5)   ;are we done?
           bne.s    updatelp       ;if not,continue
           rts

;This routine is the brains of the demo mode.
;It handles where to put the firemen to make sure all
;babies survive.
;It returns a number in d0 which is like a keycode
;so other code is unaware of who is controlling men.
computer:  moveq    #51d,d0        ;default is left side
           moveq    #3,d1          ;place on right
           moveq    #9,d2          ;place in middle
           moveq    #17,d3         ;place on left
           move.l   state(a5),d5   ;get state
           btst     d1,d5          ;baby on right?
           bne.s    returnlf       ;if so, return a "3"
           btst     d2,d5          ;baby in middle?
           bne.s    returnle       ;if so, return a "2"
           btst     d3,d5          ;baby on left?
           bne.s    returnld       ;if so, return a "1"
           lsr.l    #1,d5          ;move forward in time
           bne.s    aheadlp        ;keep going if any more
           rts
           rts
           rts
           rts
returnld:  moveq    #51d,d0
           rts
returnle:  moveq    #51e,d0
           rts
returnlf:  moveq    #51f,d0
           rts
what:      move.l   exchbase(a5),a6 ;set up for execs
           move     #-1,code(a5)    ;default case
           move.l   uport(a5),a0    ;get msgport
           move.b   mp_sigbit(a0),d1 ;get signal bit
           moveq    #1,d0           ;make a mask
           asl.l    d1,d0           ;make a mask
           move.l   mytask(a5),a0   ;get our task block
           move.l   tc_sigrecvd(a0),d1 ;get our signals
           and.l    d0,d1           ;apply mask
           beq.s    none           ;if zero, none there
           jsr     _lvowait(a6)     ;let exec clear it
msgloop:   move.l   uport(a5),a0    ;get a message
           jsr     _lvogetmsg(a6)
           tst.l    d0
           beq.s    donelp         ;if zero, we are done
           move.l   d0,-(a7)        ;push the message
           pea     nextmsg(pc)      ;push return address
           move.l   d0,a4

```

(continued)

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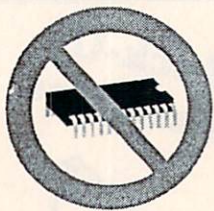
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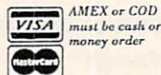
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```

move.l im_class(a4),d0      ;look at class
cmpi.l #rawkey,d0          ;is it a rawkey?
beq rkey

donelp:
none:   rts                 ;sloppy, different
                        ;things use this rts

nextmsg: move.l (a7)+,a1      ;get the message
        jsr _lvoreplymsg(a6) ;reply it
        bra.s msgloop        ;continue

rkey:   move im_code(a4),d0    ;get the code
        tst.b d0              ;is it a key-up?
        bmi.s notdown        ;if so, ignore
        move d0,code(a5)     ;save in code

notdown: rts

;Routine to clear d0 bytes at a0
clearmem: clr.b (a0)+
        subq #1,d0
        bne.s clearmem
        rts

;Make a bounce sound
sound:  tst attract(a5)       ;attract mode is quiet
        bne.s dontsnd        ;skip if so
        move.l d0,-(a7)       ;save
        lea soundio(a5),a1    ;get io block
        move.l exccbase(a5),a6 ;set up for execs
        jsr _lvoccheckio(a6) ;are we busy?
        tst.l d0
        bne.s quiet          ;if not zero,ok
        lea soundio(a5),a1
        move.l io_device(a1),a6 ;and volume
        jsr dev_abortio(a6) ;abort sound
        lea soundio(a5),a1    ;get io block
        move #cmd_write,io_command(a1)
        move.l memory(a5),a0 ;get CHIP start
        adda #soundbuf-datastart,a0 ;add offset
        move.l a0,ioa_data(a1) ;point to waveform
        moveq #2,d0           ;length is 2 bytes
        move.l d0,ioa_length(a1) ;save in length
        move #80,ioa_cycles(a1) ;play 80 cycles
        move.b #adiof_pervol,io_flags(a1) ;change both
        move #2590,ioa_period(a1) ;period
        move #64,ioa_volume(a1) ;and volume
        move.l io_device(a1),a6 ;get device base
        jsr dev_beginio(a6) ;do io
        lea soundio(a5),a0 ;copy over

```

```

lea io2(a5),a1 ;to secondary io block
move ioa_period(a0),ioa_period(a1) ;copy period
move ioa_volume(a0),ioa_volume(a1) ;copy volume
move.l (a7)+,d0

donsnd: rts
sndchnge: move.l exccbase(a5),a6 ;set up for execs
        lea soundio(a5),a1 ;get io block
        jsr _lvoccheckio(a6) ;are we doing sound?
        tst.l d0
        bne.s nosound ;if not zero, skip
        lea io2(a5),a1 ;otherwise, modify it
        move #adcmd_pervol,io_command(a1)
        move.b #adiof_synccycle,io_flags(a1) ;sync on cyc
        subi #150,ioa_period(a1) ;raise frequency
        move.l io_device(a1),a6 ;get device base
        jsr dev_beginio(a6) ;do io

nosound: rts

```

;This routine sets up d0,d1 and d2 for a baby operation
;d0=X,d1=Y,d2= which of four babies, each 90 degree
;possibility

```

setbaby: mulu #6,d0 ;each entry 6 bytes
        lea locs(pc),a0 ;get start of table
        adda d0,a0 ;move out to entry
        move (a0)+,d0 ;get data
        move (a0)+,d1
        move (a0)+,d2
        rts

```

;Put a baby. Falls through to figure

putbaby: bsr.s setbaby

;This is a complicated blitter routine. It will do
;variable sized blits, based on which figure to put
;d0=X,d1=Y,d2=figure number
;It looks in the moving: table for the offset
;into the CHIP memory block

;The first word is what to put in blitsize
;The next word is what to put in blitmod c and d
;The next word is exactly how many bytes per bitplane
;Then comes the stencil, which has one bits where
;the blit is supposed to have effect
;Then the bitplanes

```

;for each blit, A points to the stencil
;B points to a bitplane
;C,D point to video bitplane
figure: move.l nextop(a5),a2 ;get op pointer

```

```

move d0,d4
andi #000f,d4 ;mask so low 4 of X
ror #4,d4 ;rotate to upper 4
move d4,op_con1(a2) ;put in con1 for shifts
ori #0fca,d4 ;OR in minterm
move d4,op_con0(a2) ;put in con0

```

```

moveq #-2,d4 ;mods for a and b = -2
move d4,op_omod(a2)
move d4,op_bmod(a2)
move.l #ffff0000,op_aflwm(a2) ;throw away last
; keep all of first

```

```

move d0,d4
lsr #4,d4 ;compute word
add d4,d4 ;double for byte addr
move d1,d3
mulu #40,d3 ;compute line
add d3,d4 ;compute word offset
;into bitplane

```

```

lea moving(pc),a3 ;start of figure table
adda d2,a3
adda d2,a3
move (a3),d3 ;get element
move.l memory(a5),a3 ;add to CHIP offset
adda d3,a3 ;blitsize for later
move (a3)+,d3 ;mods for video's C&D
move d3,op_cmod(a2)
move d3,op_dmod(a2)
move (a3)+,d3 ;get size of a bitplane
move.l a3,op_apt(a2) ;stencil follows

```

```

move.l myplanes(a5),a1 ;table of bitplanes
moveq #opsize,d5 ;size of an operation

```

```

moveq #depth,d6 ;depth operations
adda d3,a3 ;skip to new bitplane
figurelp: move.l a3,op_bpt(a2)
        move.l (a1)+,a0 ;next video bitplane
        adda d4,a0 ;add offset
        move.l a0,op_cpt(a2) ;put in C and D
        move.l a0,op_dpt(a2)
        move sizetemp(a5),op_bltsize(a2)

```

;The following moves copy data that doesn't change into
;the next operation. The last copy is wasted
;as it is written over by the next figure.

```

move.l op_apt(a2),opsize+op_apt(a2)
move.l op_con0(a2),opsize+op_con0(a2)
move.l op_omod(a2),opsize+op_omod(a2)
move.l op_cmod(a2),opsize+op_cmod(a2)

```



```

move.l op aflwm(a2),opsize+op aflwm(a2)
adda d5,a2 ;skip to new operation
subq #1,d6 ;depth counter
bne.s figurelp ;if more, continue
move.l a2,nextop(a5) ;save for future
addq #depth,numberops(a5) ; just did depth ops
rts

erasbaby: bsr setbaby ;set up for erase
;The following routine erases a figure.
;The only differences from the figure routine above are:
; no B needed because not copying, only clearing
; different minterm
erase: move.l nextop(a5),a2

move d0,d4
andi #000f,d4
ror #4,d4
clr op_con1(a2)
ori #0b0a,d4
move d4,op_con0(a2)

moveq #-2,d4
move d4,op_amod(a2)
move.l #ffff0000,op aflwm(a2)

move d0,d4
lsr #4,d4
add d4,d4
move d1,d3
mulu #40,d3
add d3,d4

lea moving(pc),a3
adda d2,a3
adda d2,a3
move (a3),d3
move.l memory(a5),a3
adda d3,a3
move (a3)+,sizetemp(a5)
move (a3)+,d3
move d3,op_cmod(a2)
move d3,op_dmod(a2)
move (a3)+,d3
move.l a3,op_apt(a2)

move.l myplanes(a5),a1

moveq #opsize,d5

eraselp: moveq #depth,d6
move.l (a1)+,a0
adda d4,a0
move.l a0,op_cpt(a2)
move.l a0,op_dpt(a2)
move sizetemp(a5),op_bltsize(a2)
move.l op_apt(a2),opsize+op_apt(a2)
move.l op_con0(a2),opsize+op_con0(a2)
move.l op_amod(a2),opsize+op_amod(a2)
move.l op_cmod(a2),opsize+op_cmod(a2)
move.l op aflwm(a2),opsize+op aflwm(a2)
adda d5,a2
subq #1,d6
bne.s eraselp
move.l a2,nextop(a5)
addq #depth,numberops(a5)
rts

;Do all blitter operations that have been stored, if any.
;An operation consists of all the registers to be
;loaded into the blitter. We do an ownblitter to make
;sure we don't mess up anyone else's operations.
doops: move numberops(a5),d3 ;did we do any?
beq.s noops
move.l exechbase(a5),a6 ;set up for execs
jsr _lvoforbid(a6) ;no task switches
move.l gfxbase(a5),a6 ;set up for graphics
jsr _lvownblitter(a6) ;get blitter for use
lea operations(a5),a1 ;start of operations
lea hardware,a0 ;hardware registers
move #08400,dmaconr(a0) ;make blitter nasty

;We check to see if the blitter is busy, just in case.
;Supposedly ownblitter does this, but a bug in intuition's
;OpenScreen causes an early return, so we'd better be
;careful...
move #04000,d7 ;bit to check for busy
waitblt2: move dmaconr(a0),d6 ;check status
and d7,d6 ;is blitter busy?
bne.s waitblt2 ;if so, wait
doopl: move.l (a1)+,bltcon0(a0) ;set up blitter stuff
move (a1)+,bltamod(a0)
move (a1)+,bltbmod(a0)
move (a1)+,bltcm0(a0)
move (a1)+,bltdmod(a0)
move.l (a1)+,bltafwm(a0)
move.l (a1)+,bltapt(a0)
move.l (a1)+,bltbpt(a0)

```

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```

move.l (a1)+,bltapt(a0)
move.l (a1)+,bltdpt(a0)
move (a1)+,bltsize(a0) ;this one does it
;This next check is not exactly like busy-waiting, which
;is bad. Since the blitter is nasty, the 68000 will
;get almost no cycles and this code will probably only
;execute a few times, if any.
waitblt: move dmaconr(a0),d6 ;get status
and d7,d6 ;check if busy
bne.s waitblt ;if so, wait
subq #1,d3 ;any more operations?
bne.s doopl ;if so, continue
jsr _lvodisownblitter(a6) ; release the blitter
move.l exechbase(a5),a6 ;set up for execs
jsr _lvopermit(a6) ;allow task switching

;fall through to clearops
clearops: lea operations(a5),a0 ;point to start
move.l a0,nextop(a5) ;of operations
clr numberops(a5) ;no ops

noops: rts

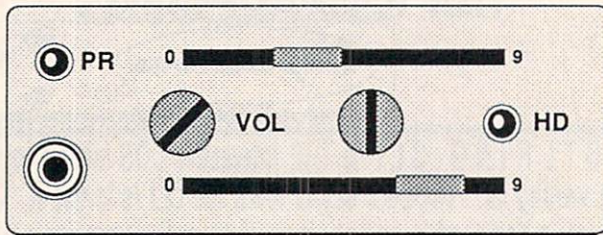
;This routine makes a random 8-bit number in d0
;It is does a shift where the new bit is exclusive-or
;of two high bits.
;Taken long ago from an article in Dr. Dobbs Journal
;of a game called CHASE on the 8080
rnd: move.l seed(a5),d0 ;get seed
moveq #8,d2 ;will do 8 times
rtop: move.b d0,d1
ror.b #3,d1 ;get 5th bit
eor.b d0,d1 ;eor with 2nd bit
roxr.b #2,d1 ;put in X flag
roxr.l #1,d0 ;shift in to seed
subq #1,d2 ;any more?
bne.s rtop ;continue if more
move.l d0,seed(a5) ;restore seed
rts

;This is the location table for all babies.
;Its format is X,Y,baby number 1-4
; 26 babies
locs: dc 1,32,1,28,34,2,41,48,3,50,64,4
dc 55,82,1,60,110,2,62,127,3,60,152,4
dc 62,171,1,77,160,2,86,141,3,93,122,4
dc 111,108,1,127,122,2,136,141,3,147,157,4
dc 152,171,1,167,153,2,180,140,3,197,129,4

```

(continued)

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```

dc      214,140,1,228,157,3,242,171,1,256,152,1
dc      271,134,3,300,139,1
;This is a table of the offsets into our CHIP block
;for the various figures
moving: dc      firemen-datastart      :0
dc      baby1-datastart      :1
dc      baby2-datastart      :2
dc      baby3-datastart      :3
dc      baby4-datastart      :4
dc      digit0-datastart     :5
dc      digit1-datastart
dc      digit2-datastart
dc      digit3-datastart
dc      digit4-datastart
dc      digit5-datastart
dc      digit6-datastart
dc      digit7-datastart
dc      digit8-datastart
dc      digit9-datastart
dc      title-datastart      :15
dc      splat-datastart      :16
dc      dash-datastart       :17
dc      truck-datastart      :18
dc      building-datastart   :19

;This is the start of the data that must be in CHIP
;memory. If it is already in CHIP, we will not bother
;to allocate and copy.
datastart:
;These are the figures for blitter copies.
;This data was made by dumping a brush file.
;A paint program was used to make each figure.
;One program to dump data is on the Iff disk, Fred Fish 16.
;It will produce 'C' code, which you will have to edit.
baby1:  dc      $0402,36,32
dc      $0700,$0f80,$0f80,$0700,$0700,$1fc0,$bfe8,$6fb0
dc      $0f80,$0700,$0f80,$4f90,$7ff0,$1fc0,$0000,$0000
dc      $0000,$0500,$0000,$0200,$0000,$0000,$0000,$0000
dc      $0000,$0000,$0f80,$0f80,$0700,$0700,$0000,$0000
dc      $0700,$0a80,$0f80,$0500,$0700,$1fc0,$bfe8,$6fb0
dc      $0f80,$0700,$0000,$4010,$78f0,$18c0,$0000,$0000
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
baby3:  dc      $0402,36,32
dc      $0000,$0000,$1fc0,$7ff0,$4f90,$0f80,$0700,$0f80

```

```

dc      $6fb0,$bfe8,$1fc0,$0700,$0700,$0f80,$0f80,$0700
dc      $0000,$0000,$0700,$0700,$0f80,$0f80,$0000,$0000
dc      $0000,$0000,$0000,$0000,$0000,$0200,$0000,$0500,$0000
dc      $0000,$0000,$18c0,$78f0,$4010,$0000,$0700,$0f80
dc      $6fb0,$bfe8,$1fc0,$0700,$0700,$0500,$0f80,$0a80,$0700
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
baby2:  dc      $0402,36,32
dc      $0080,$3100,$2180,$60c0,$7bcc,$7ffe,$7ffe,$7ffe
dc      $7bcc,$60c0,$2180,$3100,$0080,$0000,$0000,$0000
dc      $0000,$0000,$0000,$0000,$1800,$7804,$7810,$7804
dc      $1800,$0000,$0000,$0000,$0000,$0000,$0000,$0000
dc      $0080,$3100,$2180,$60c0,$63cc,$07fa,$07ee,$07fa
dc      $63cc,$60c0,$2180,$3100,$0080,$0000,$0000,$0000
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
baby4:  dc      $0402,36,32
dc      $0100,$008c,$0184,$0306,$33de,$7ffe,$7ffe,$7ffe
dc      $33de,$0306,$0184,$008c,$0100,$0000,$0000,$0000
dc      $0000,$0000,$0000,$0000,$0018,$201e,$081e,$201e
dc      $0018,$0000,$0000,$0000,$0000,$0000,$0000,$0000
dc      $0100,$008c,$0184,$0306,$33c6,$5fe0,$77e0,$5fe0
dc      $33c6,$0306,$0184,$008c,$0100,$0000,$0000,$0000
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
dc      $ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff,$ffff
;bitmap:w=80,h=21
firemen: dc      $0546,28,210
;stencil
dc      $0ff0,$0000,$0000,$01fe,$0000
dc      $3ff0,$0000,$0000,$01ff,$8000
dc      $fff8,$0000,$0000,$03ff,$e000
dc      $07e0,$0000,$0000,$00fc,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
dc      $03e0,$0000,$0000,$00f8,$0000
dc      $01c0,$0000,$0000,$0070,$0000
dc      $03e0,$0000,$0000,$00f8,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
dc      $07fe,$0000,$0000,$0ffc,$0000
dc      $07ff,$ffff,$ffff,$ffff,$0000
dc      $03fb,$ffff,$ffff,$fbf8,$0000
dc      $03f8,$e000,$0000,$e3f8,$0000
dc      $07f0,$0000,$0000,$01fc,$0000
dc      $07f0,$0000,$0000,$01fc,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
dc      $03f8,$0000,$0000,$03f8,$0000
dc      $03fc,$0000,$0000,$07f8,$0000
dc      $07bc,$0000,$0000,$07bc,$0000
dc      $0f1e,$0000,$0000,$0f1e,$0000
dc      $1f1f,$0000,$0000,$1f1f,$0000
;plane0
dc      $0fe0,$0000,$0000,$00fe,$0000
dc      $3ff0,$0000,$0000,$01ff,$8000
dc      $fff8,$0000,$0000,$03ff,$e000
dc      $0020,$0000,$0000,$0080,$0000
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dc      $0000,$0000,$0000,$0000,$0000
dc      $0000,$0000,$0000,$0000,$0000
dc      $03e0,$0000,$0000,$00f8,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
dc      $07fe,$0000,$0000,$0ffc,$0000
dc      $07fc,$0000,$0000,$07fc,$0000
dc      $03f8,$0000,$0000,$03f8,$0000
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dc      $07f8,$0000,$0000,$03fc,$0000
dc      $03f8,$0000,$0000,$03f8,$0000
dc      $03fc,$0000,$0000,$07f8,$0000
dc      $07bc,$0000,$0000,$07bc,$0000
dc      $0f1e,$0000,$0000,$0f1e,$0000
dc      $1f1f,$0000,$0000,$1f1f,$0000
;plane1
dc      $0ff0,$0000,$0000,$01fe,$0000
dc      $3ff0,$0000,$0000,$01ff,$8000
dc      $fff8,$0000,$0000,$03ff,$e000
dc      $07c0,$0000,$0000,$007c,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
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dc      $03e0,$0000,$0000,$00f8,$0000
dc      $07f8,$0000,$0000,$03fc,$0000
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dc      $07fc,$7fff,$ffff,$fc7c,$0000
dc      $03f8,$1fff,$ffff,$03f8,$0000
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dc      $0000,$0000,$0000,$0000,$0000
dc      $0000,$0000,$0000,$0000,$0000
dc      $0000,$0000,$0000,$0000,$0000
;plane2
dc      $0ff0,$0000,$0000,$01fe,$0000
dc      $3ff0,$0000,$0000,$01ff,$8000

```


The Developing AMIGA

by Stephen R. Pietrowicz

Programming Tools

I've always liked programming utilities. Most of my programming background is on UNIX, where development utilities abound. It's great to have a rich environment with many utilities to help you during a development cycle.

There are many different types of utilities. Programs that find all occurrences of a word in a file, programs that tell you the differences between one file and another, and programs that cross-reference variables and functions can make your programming tasks much easier. Probably one of the most interesting types of utilities are programs that actually generate code for use in your own programs.

In UNIX, programs like LEX and YACC (Yet Another Compiler Compiler) can generate functions written in C that you can use in your own programs. LEX generates lexical analyzers, and YACC generates parsers. (A version of YACC, called BISON, is available on a Fred Fish disk.) LEX and YACC are used primarily to write compilers, but they can also be used to write other applications, such as shell programs. They can be valuable tools if you need a scanner or parser quickly, but you can't spend much time actually going through the mechanics of writing them.

If you've tried to create menus and gadgets for Amiga programs, you already know how hard it can be. It's a laborious process of writing the code for the data structures, compiling the program,

checking to see what mistakes you've made, correcting them, and compiling again. This process continues until you're satisfied with how everything looks. It can take a long time to get everything perfect, so you'll be happy to know there are Amiga programs that can make creating menus and gadgets much easier.

NOTE: All the programs I'm going to tell you about are available on the Fred Fish disks, from PeopleLink, and from various BBSs around the country.

MenuEd

MenuEd is a shareware program by David Pehrson of Mantis Development. As its name implies, it's a menu editor. MenuEd lets you construct how you want your menus to appear on the screen, and then generate C code for those programs.

Using MenuEd, you can quickly construct the menu titles, menu items, and menu subitems. You can set the text attributes of your menus (plain, bold, italic, underlined, or any combination of these), plus check marks, command keys, and more. Clicking on the "test" gadget replaces MenuEd's menus with the menus you constructed, so you can even see how they look!

MenuEd can write C code for the menu data structures you've designed, or save them in a special format you can reload later. I always save a copy of the menus I use in the MenuEd format, just in case I want to change or add menu items later.

David Pehrson asks that anyone who uses MenuEd please send \$15 to help cover development costs. You receive the latest update to MenuEd and a printed manual. Considering the time you can save with menu items that work the first time, I think it's money well spent. If you've tried to create your own menus before, you've got to see the program!

VGad

Another great utility I came across recently is VGad. VGad generates the C code for gadgets with quite impressive results. You design two screens with your favorite paint program that supports IFF. On the first screen, you draw gadgets as they'll appear in their initial unselected state. On the second screen, you draw the gadgets as they'll appear in their selected state.

After you have designed the screens, run VGad. With the mouse and keyboard, box out areas of the screen you want and tell VGad to turn them into gadgets. VGad automatically generates image and gadget data structures necessary for your gadgets. VGad can also generate the image structures without the gadgets (if that's what you want to use), and it supports creation of windows.

VGad also allows you to get creative with your gadgets. You don't have to limit yourself to simple text strings in your gadgets anymore. You can even draw an unhappy face that changes to a

(continued)

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happy face when it is selected. After VGad generates the code for your gadgets, changing the files it generates to chain the gadgets and attaching them to the window you've generated is relatively simple.

Included in the VGad.ARC file are sample IFF pictures, source and executable for a simple test program that illustrates how VGad works. Again, if you've been frustrated creating gadgets, VGad is definitely something to look at.

VGad, written by Stephen Vermeulen, is freely distributable for reasonable media costs.

Other Code Generating Problems

NGI, by National Pixel Products, takes IFF picture files and produces the C structures for GELs, Sprites, and Workbench icons. It's quite easy to use, and even allows you to name the structures NGI generates. This way you can avoid accidentally declaring two structures with the same name.

I should also mention PowerWindows by Inovatronics, a very capable program many developers use. PowerWindows 2.5 allows you to design screens, windows, and gadgets, and outputs the code in any of the following formats: 68000 Assembler, Manx C, Lattice C, CSI Multi-FORTH, TDI Modula-2, True BASIC, AmigaBASIC, or AC/BASIC compiler! PowerWindows 2.5, which should be out by the time you read this, costs \$89.95. If you want to generate code above and beyond what the current PD and shareware code generators provide, check out PowerWindows.

Programs such as MenuEd, VGad, NGI, and PowerWindows allow you to concentrate on the most important part of your program: making the user interface look easy to use and attractive. Think about it; which programs do you use most often? The programs with the best interfaces, of course! No one wants to use a program that is difficult to use. With programs like those covered here, you'll never have to say, "Well, I finally have the menus working. I'm not going to touch those things again. They're too hard to change."

Wrap Up

What type of information would you like to see in this column? If you have any news, suggestions, questions, or programming hints please feel free to send them in to:

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Stephen R. Pietrowicz is an assistant chairman of People/Link's Amiga Zone, a freelance writer, author of ACO, the sound and graphics conferencing program, and a member of The C Group.

•AC•

by John Steiner

Bug Bytes

The Bugs & Upgrades Column

Two readers report a bug in PageSetter, Gold Disk's desktop publishing software. Reports center around several duplicate entries in the font list. A call to Gold Disk confirmed no problem with the font list. Using PageSetter and creating documents with several font types and sizes seemed to point out that more than one font list is available. PageSetter lists all ROM fonts, all fonts currently in RAM, and finally, all fonts in the assigned fonts directory. This set-up allows faster access as you swap between fonts already used in your publications.

While working with Professional Page, I ran across a bug that can cause a document to be lost. The bug has been duplicated on two different Amiga 2000s and an Amiga 1000 installation. If you link two or more boxes and delete or resize earlier text so there is at least one empty box at the end of the link, you set up the problem. If you use "select all" or "shift-F4" to select the text, the program immediately begins consuming RAM. It never completes the "select all" command and consumes RAM until the machine gurus. If you use linked boxes, watch for this one. You can lose a lot of work. If you have linked boxes in your document, save before you "select all."

In its Spring 1988 newsletter, Gold Disk announced an upgrade to the GoldSpell spelling checker. GoldSpell II now supports files from WordPerfect, Professional Page, PageSetter, Textcraft and Textcraft Plus, Scribble!, as well as generic ASCII files. A batch correction function allows lengthy documents to be checked without user interaction. Errors can then be corrected later. Personalized user dictionaries are also supported. A

"search and replace" feature allows automatic word swapping (such as color for colour, or theater for theatre). Current Gold Spell users can upgrade to GoldSpell II for \$20.00 U.S. or \$25.00 Canadian.

Gold Disk
Box 789 Streetsville
Mississauga, ONT Canada L5M 2C2
1-800-387-8192 (U.S. only)

Absoft Corporation has announced upgrades for two of its language compilers. The latest version of Absoft's AC/FORTRAN is version 2.3. Current users of version 2.2 can upgrade to version 2.3 for \$50.00.

Registered users of AC/BASIC should have already received version 1.3, which began shipping in late May. The no-charge upgrade includes an Environment Editor that allows you to modify the function of certain elements of the AC/BASIC compiler and runtime system. You can customize a runtime library for a particular application or suppress default display characteristics while the compiler is running.

Compiler improvements include enhanced compatibility with AmigaBASIC, additional error checking, and modifications to the SELECT CASE statement to make AC/BASIC more compatible with QuickBASIC 4.0 (which runs on MS-DOS computers). Several bug fixes correct problems found in version 1.2. Several example programs

are included on the disk, including a great BASIC spreadsheet program that can be customized and compiled.

If you have version 1.2 of AC/BASIC and have not received the upgrade, you probably did not send in your registration card. To receive the no-charge upgrade, send your registration card to:

Absoft Corporation
2781 Bond St
Auburn Hills, MI 48057
(313) 853-0108

Several people who use software supporting PostScript printers report problems printing to PostScript printers. Programs such as Professional Page, Laser Script, and WordPerfect have PostScript drivers capable of driving these high quality printing devices. Often the problems reported have revolved around the inability to print large files. Small files (up to several pages of text and no graphics) print fine, but large files never come out of the printer, or only print the first couple of pages.

Most of the time, you must match the handshaking option in Preferences and the laser printer. The printer bogs down while printing a large graphic or a complex document and cannot tell the Amiga to stop sending the file. When the printer again begins gathering data from the computer, it gets confused

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because some commands have been missed. Postscript then refuses to accept any more data until it receives an end of file marker.

To correct the problem, make sure handshaking is set to hardware mode in both the printer and Preferences. If your printer won't handle hardware handshaking, or if you share the printer with other computers that are working properly, set the baud rate to 1200, rather than 9600. This change allows the printer plenty of time to keep up with the computer.

If an error occurs, Postscript printers always send error messages back to the software. Unfortunately, most software packages ignore these error messages. If you have a file that will not print and you are not sure why, simply print the file to disk, rather than the printer. Then use a telecommunications program that allows you to split the screen between text being sent and text being received to send the file to the printer. Send the file as ASCII text, not Xmodem or any other packet protocol. At the point of error, the Postscript printer sends the error message to the communications software, which then displays the message on the screen. You need split screen software because error messages are mixed within the text being sent and can quickly be lost as they scroll off the screen.

Oxxi, Inc. is now shipping MaxiPlan version 1.9. The new version includes mostly bug fix and a couple of new features, including a Blitter Option in Charts which allows a second color to be displayed in either the Chart Border Area or Data Area. Column widths can now be changed by dragging the mouse, so keyboard entry of column widths is no longer required.

Registered owners receive the upgrade automatically. If you have not registered your MaxiPlan package, call Oxxi directly for upgrade information.

In other news from Oxxi, Nimbus version 1.3 is now available. The latest version contains bug fixes and enhanced menu and mouse functions. The manual has been rewritten and expanded. If you are interested in receiving the expanded manual and the latest version, call Oxxi. The upgrade will cost \$25.00 plus \$4.00 shipping and handling.

Oxxi, Inc.
Box 4000
Fullerton, CA 92634
(213) 427-1227

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R O O M E R S

by *The Bandito*

Remember the good old days when the Amiga was new, there was Kickstart 1.0, and the only software packages were GraphiCraft and TextCraft? At that time, Commodore looked for a few key types of software to help initial sales. One of these key programs was a spreadsheet: MaxiPlan. This spreadsheet was to be more powerful than Lotus 1-2-3, with great graphics and speaking spreadsheets keyed by voice synthesis. The developer was MaxiSoft, and to get its product out to the widest audience, they entered a distribution deal with Electronic Arts. But the first release of MaxiPlan had serious bugs; though MaxiSoft fixed them, the damage was done to their relationship with EA. Now, finally, the whole matter is ending up in court over \$250,000 that MaxiSoft (now Oxxi) claims EA owes them. The suit probably won't be resolved till the end of the year, given how long it's taken to get this far. But Oxxi sure could use a quarter of a million bucks for advertising and marketing, and maybe more product development.

If \$250,000 sounds like a lot, then you aren't ready for the big leagues. The lawsuit with Oxxi is trivial compared to the \$7.5 million suit against EA filed by Bethesda Software. The dispute involves Bethesda's Gridiron game for the Amiga and the ST. Bethesda had signed an Affiliated Label (AL) deal with EA, which made EA the exclusive distributor of the game. Bethesda charges that EA worked to stop development of the Mac version of the game and stole ideas from Gridiron to use in EA's upcoming John Madden Football. No response yet from EA—his lawyers are probably too busy.

In other entertainment news, Activision has changed its name to Mediagenic

(which sounds like a bio-engineering firm producing mutant couch potatoes). The Bandito observes that this tactic is the time-honored one for companies at the bottom trying to claw their way back up—when all else fails, change your name and get a new logo. It worked for NBC, after all, and now CBS is trying it, too. Ostensibly, the new name reflects the company reorganization into two divisions, one is Entertainment and the other is Creativity/Productivity.

Cynics note that this is the same type of reorganization Electronic Arts went through a year ago. Great minds think alike, though it's not too surprising—some of the great minds that were at EA are now at Mediagenic. Mediagenic's task is to revive the dormant Entertainment division with some hits. Now, if they were really clever, they could do some killer technology on the Amiga to get a reputation, and then port it over to the more mundane (but more profitable) MS-DOS and C64s. The Bandito thinks that's how to get the best games—don't you?

Broderbund, always in search of another product that will sell like Print Shop, thinks they've found it in Jam Session. This easy and fun music program is burning up the Macintosh market, and they're planning to bring it to the Apple IIGS, the IBM PC, and of course, the Amiga. The product lets anyone playing the computer keyboard sound like a professional musician. Some nice animated graphics onscreen go along with the sounds. It's like Instant Music—animated musicians play onscreen while you sound your own riffs.

News filched from West Chester dumpsters: profit margins on Amigas have been hurt by rising DRAM costs, so

don't look for any price decreases. In fact, there could be a price increase by the end of the summer. (Just when things were starting to roll, too.) Commodore has announced that there are now over 600,000 Amigas worldwide, and they hope to hit the magic million unit mark by the end of the year. Interestingly, 45 percent of Commodore's revenue is now generated by Amigas. The one million unit number is indeed magic, because many big software houses won't even talk to you unless you've sold a million units.

Look for the Microsoft deal to heat up near the end of the year. The Bandito's spies report versions of Write and Excel in the works.

Speaking of secret projects, look for some to be revealed (or at least hinted) at the upcoming AmiExpo. The Bandito hears that there will be some new versions of 3D software to shake up a few major players. NewTek will unveil a new Demo Reel which will be even better than the first one. Titling software and the animation market will see some impressive advancements. Even stodgy Commodore is contemplating a few new product announcements at AmiExpo, although final decisions won't be made until just before the show.

Rumors continue to float out of Commodore that Amiga 500's may go into mass market channels. While the sales force vehemently denies this, there's some muttering at the top levels that this entry may be the only way to get the Amiga market to critical mass. Right now, Commodore is being really nice to its dealers and spending a lot of money on training and dealer promotions. Commo-

(continued)

dore has even put together a big ad blitz for the fall, targeting the Amiga 2000 (and maybe the upcoming 2500 with the 68020 and 80286 coprocessor for MS-DOS compatibility) at professional video market and graphics professionals.

Could this be Commodore's secret plan—get dealers to move more high-margin 2000's, so when Commodore takes away the 500 to sell in the mass market, the individual dealers won't mind so much? The Bandito doubts that Commodore is that Machiavellian. On the other hand, it might work...

Another indicator of dispute at the higher levels of Commodore is the recent firing of Frank Leonardi, head marketing honcho. Could it be that there were differences of opinion over distribution channels and marketing methods?

As you may recall, the Bandito noted that some Amiga developers were planning to work on Macintosh and IBM versions of their products. One such company is Byte by Byte, who have announced a version of Sculpt-Animate 3D for the Mac II. This tidbit received some attention from the Mac press, which mentioned that the product was first available on the Amiga. More interesting is how Scott Peterson has been saying less than kind things about Commodore and the Amiga. The Bandito suggests you shouldn't throw stones before you leap over that bridge you've just burnt, to mix a fresh metaphor. Better wait until you get a Mac product out before you start bad-mouthing your only source of revenue.

Speaking of developers looking for greener pastures, Microillusions has demonstrated Photon Paint for the Mac II. The response from insiders has been mostly ho-hum. Perhaps that has something to do with Photon Paint's snail-like sales for the Amiga version. Which leads to...

HAM Paint Wars update: Sales of the current HAM paint programs, Photon Paint and Digi-Paint, have slowed to a crawl in anticipation of Deluxe PhotoLab and Digi-Paint II. By the time you read this, Deluxe PhotoLab will be out at a

price of \$150. Digi-Paint II probably won't be out until late summer, but the price will be well under \$100, according to NewTek. Look out in the summertime for the latest shots to be fired. Digi-Paint II will have a price advantage and heavy advertising, while PhotoLab will have a few more features, but a hefty price tag and no advertising. The war promises to be interesting, especially since so many more soldiers are heading for the battlefield.

The latest rumor drifting by the Bandito is that Express Paint will add HAM capabilities sometime around Christmas to become the latest entry in the HAM Paint Wars. A new version of Deluxe Paint II with halfbrite support and animation capabilities has also been seeded to some graphic artists for testing; no HAM mode yet, so it's not a top-rank fighter. Impulse's Prism is undergoing a redo called DiamondPaint. Does that mean it's expensive and very hard?

Finally, Antic Software, a leading Atari ST software publisher, will be publishing a version of its CyberPaint animation and paint program for the ST. The Amiga version, arriving this summer, is known as Zoetrope. You pay your money and you make your choices...

Piracy is so bad in Europe that they're even copying hardware! The Bandito has been told that Italian pirates have ripped off Digi-View and are making copies of the hardware in a little black case (instead of white). Apparently, they haven't quite got it right; the picture quality is not as good as the real thing, and the hardware only works with Digi-View 1.0 software. NewTek's president, Tim Jenison, is reportedly preparing "a surprise" for them. The Bandito doesn't know what that might be, but he won't be standing next to any pirates when they pry open a Digi-View.

Atari fired its U.S. computer division manager who had only been on the job for a few months. No reason was given, but industry analysts cited poor U.S. sales of Atari ST's. Atari's purchase of Federated continues to burden earnings. Ironically, the Federated stores sell more

Amigas than ST's, despite efforts to put the Amigas in back corners and pile Ataris in the front.

Since ST sales dropped, Atari has been concentrating on the video game market and researching new models. All sorts of trial balloons are floated by Atari, in typical Jack Tramiel fashion. Atari announces development of new computers about every other month it seems: 68030 based machines, transputers, UNIX boxes, and more. It's just Uncle Jack, up to his old tricks again. Let's make an announcement and see if there's any interest before we actually start producing something. Whatever happened to those low-cost IBM clones? Where is the blitter chip, anyway?

You've gotta feel sorry for those poor people who bought ST's. They believed the salesmen talking about millions being sold, all the major software available. Oh, sure, it's better than an Amiga. It reminds the Bandito of the time the Commodore Plus 4 was going to conquer the computer market.

EA's hot new Interceptor flight simulator sold out its first run in less than a week. More scenery disks and a new, even hotter version have been announced by designer Moses Ma. The real news is that they intend to distribute these new versions themselves, not through Electronic Arts. Ya get one hit, and it goes to your head.

Jay Miner, father of the Amiga, is recovering well from surgery. But all you publishers, take note: send him your Amiga software, and he'll feel better. The Bandito thinks there's something wrong if the creator of the Amiga has to buy software. Don't you agree?

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[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of Amazing Computing™ cannot be held responsible for the reports made in this column.]

Amiga Libraries and the FFP and IEEE Math Routines

by Steve Faiwischewski

Thanks to the Amiga, many strange terms like "multitasking" and "custom coprocessors" have become household words. "Library" can now be added to the list of the transformed. The concept of libraries on mainframes and minicomputers has been around for a long time, but until quite recently, it was unknown to the micro world.

What Is a Library?

To paraphrase the *ROM Kernel Manual*, a library is a machine code interface that allows the programmer to call system routines without knowing their precise locations in advance. A library consists of code and data segments, and a collection of jump instructions that point to various routines in the library's code segment. The provider of the library (Commodore or some third party) publishes the address of each jump instruction, so programmers can access the library's routines through these instructions. The routines can be anywhere in the library, but the jump instructions are always in the same order and location.

Advantages

The greatest advantage of using a library is the ability to develop programs that can work with different versions of the same library without recompiling or relinking. Since a major part of the Amiga system (such as Intuition, graphics routines, and AmigaDOS) is provided through libraries, most programs are quite independent of the operating system and work properly with different versions of Kickstart and Workbench. Another advantage of libraries is that any routine supplied in one can be used by many different programs without duplicating the routine's code within them. This provides a tremendous saving in memory and disk space.

Use

Before a library can be used, it must be opened with a call to `OpenLibrary`. `OpenLibrary`'s arguments are the library name and the expected version of the library. If the library version number is lower than what is specified by the user, `OpenLibrary` fails. This allows the user to assure that a specific library version is present, if such a version is required for it to run properly.

`OpenLibrary` causes the system to search for the named library in the system library list. If the library is not currently in RAM, AmigaDOS searches for it in the `DEVs:` directory on disk. `OpenLibrary` returns a pointer to the library's base if the open is successful, or nil if the open fails.

`OpenLibrary` is declared in the Benchmark package as follows:

```
PROCEDURE OpenLibrary(libname : ADDRESS; version :  
LONGCARD): LibraryPtr;
```

where `libname` is the address of the name of the desired library.

Once the library is open, the user can call a library routine by setting up all registers required by the routine, and then transferring control to one of the entries in jump table. The jump table entry is specified as an offset from the library base pointer (which is returned by `OpenLibrary`). As mentioned earlier, these offsets must be made public by the library's creator.

Library Calls in High-Level Languages

Since the library is a low-level mechanism (in that it requires assembly code to set up all the registers and to perform the call to the jump table entry), most high-level language packages provide routines that are the "glue" to the library calls. These routines are intermediate steps between the user's high-level program and the library's low-level code.

Using these "glue" routines creates a bit of overhead (since the CPU wastes some time in the "glue" routine setting things up, instead of jumping directly to the library code), but the programmer's life would be much more difficult without them. The "glue" routines appear as a linkable library in C packages, and as support modules in Modula-2 packages. For example, all procedures in module `Intuition` do nothing but load arguments into registers and call the appropriate `Intuition` library routine.

Rolling Your Own Library Interface

If you want to use a certain library in Modula-2, you need to code your own interface to that library. Most Amiga hardware and software packages are geared toward C, so when a new library is introduced, only the C glue routines are supplied. There are also standard Amiga libraries that the existing Modula-2 compilers don't address. For example, the TDI compiler does not support Motorola FFP (Fast Floating Point) REALs, while Benchmark does not support IEEE double precision REALs.

To write an interface, you must know: a) what arguments the library's functions expect and; b) the functions' offsets (their locations) from the library base. This information can be obtained from the `.fd` files (usually provided by library supplier). The `.fd` files are simply text files containing the description of

(continued)

the routines' input and output parameters, and the location of each routine's entry in the jump table. These .fd files are also used in AmigaBASIC, so any new library should include them.

To calculate the offsets, use the "bias" field for the starting offset. Negating that value gives the first function's offset from the library base. For example, if "bias" is 30, the offset to the first routine is -30. The size of each jump entry is 6 bytes, so the offset of the second library routine is -36, the third is -42, and so on. For each routine, the .fd file also contains a list of registers that must be set up with data before a call is made to that routine. Unfortunately, the .fd file does not specify *what* has to go in the listed registers. This information must come from some other documents (which should be provided with the library), such as Commodore's *AutoDocs*, the *RKM*, or other manuals.

Once you obtained all the above information, writing a "glue" procedure is easy. Use SETREG to set up the needed registers with relevant data. SETREG register A6 with the library's base pointer, and code an inline instruction to do a JSR (jump subroutine) through A6, with the offset for the particular routine. The assembler equivalent instruction would be:

```
JSR    <RoutineOffset>(A6)
```

To generate the JSR instruction inline, use the CODE statement with TDI, and INLINE with the Benchmark compiler. The Benchmark documentation states that register A6 is used as scratch, so there's no need to preserve its value. However, TDI's documentation does not mention register usage. But, looking at TDI's own glue routines, I noticed that register A6 is preserved. Accordingly, you should follow TDI's example when using that compiler.

Math Libraries

The accompanying listings provide the "glue" routines for interfacing TDI code to the FFP library, and Benchmark code to the IEEE double precision library. While using FFP library calls to do math is not as convenient as using the compiler's built-in arithmetic operators and various transcendental functions, the performance improvement gained by the FFP calls is significant.

If your application calls for some heavy number crunching that requires single precision, it is definitely advantageous to use the FFP routines. If you are using the Benchmark compiler (which uses FFP for its built-in math functions) and your application calls for double precision computation, you can use the accompanying IEEE module (until double precision REALs are added to Benchmark as standard types).

Recent Modula-2 News

A few months ago, Avant Garde Software began distributing the final version of the Benchmark compiler. The final release fixed all the known beta release bugs, and includes a cleaner and superior manual.

The beta release users received the news with mixed reactions. Most users bought the beta release from Oxxi, the original distributor of the package. Soon after, Oxxi and Leon Frenkel, the compiler's author, became entangled in a legal dispute. In the meantime, Frenkel developed and marketed the final release on his own, leaving the beta users up in the air. Frenkel does, however, offer an upgrade path to beta users.

For more information, contact Avant Garde Software.

Avant Garde Software
2213 Woodburn
Plano, TX 75075
Tel: (214) 964-0260

LISTING ONE

```
DEFINITION MODULE MathIeeeDouble;

  (*****
  (* IEEE Double Precision functions for the Benchmark *)
  (* compiler. *)
  (* Steve Faiwizewski April 15, 1988 *)
  (*****)

  FROM Libraries IMPORT LibraryPtr;

  CONST
    MathIeeeDoubleName = 'mathieeedoubbas.library';

  TYPE
    DIeeeReal = RECORD
      Low,
      High : LONGCARD;
    END;

    CmpResult = [-1..1];

  VAR
    MathIeeeDoubBasBase : LibraryPtr;

  PROCEDURE IeeeDPFix(r : DIeeeReal) : LONGINT;
  (* Convert r to a LONGINT, truncating any fractional part *)

  PROCEDURE IeeeDPFlt(i : LONGINT; VAR r : DIeeeReal);
  (* Convert a LONGINT to DIeeeReal *)

  PROCEDURE IeeeDPCmp(r1, r2 : DIeeeReal) : CmpResult;
  (* Compare r1 and r2 *)
  (* result: if r1 = r2 -> 0 *)
  (* if r1 > r2 -> 1 *)
  (* if r1 < r2 -> -1 *)

  PROCEDURE IeeeDPTst(r : DIeeeReal) : CmpResult;
  (* Compare r with 0 *)

  PROCEDURE IeeeDPAbs(input : DIeeeReal;
    VAR output : DIeeeReal);
  (* output := |input| *)

  PROCEDURE IeeeDPNeg(input : DIeeeReal;
    VAR output : DIeeeReal);
  (* output := - input *)

  PROCEDURE IeeeDPAdd(r1, r2 : DIeeeReal;
    VAR output : DIeeeReal);
  (* output := r1 + r2 *)

  PROCEDURE IeeeDPSub(r1, r2 : DIeeeReal;
    VAR output : DIeeeReal);
  (* output := r1 - r2 *)
```



```

PROCEDURE IeeeDPMul(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
(* output := r1 * r2 *)

PROCEDURE IeeeDPDiv(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
(* output := r1 / r2 *)

PROCEDURE IeeeDPFloor(input : DIEEEReal;
VAR output : DIEEEReal);

PROCEDURE IeeeDPCeil(input : DIEEEReal;
VAR output : DIEEEReal);

PROCEDURE CloseIeeeLib;

END MathIeeeDouble.

IMPLEMENTATION MODULE MathIeeeDouble;

(*****
* IEEE Double Precision functions for the Benchmark *
* compiler. *
* Steve Faliszewski April 15, 1988 *
*****)

FROM Libraries IMPORT OpenLibrary, CloseLibrary, LibraryPtr;

FROM SYSTEM IMPORT SETREG, REG, INLINE, ADDRESS, ADR;

CONST
(* The following offsets are for Kick/Bench 1.2. *)
(* They may change for later releases! *)

FixOffs = -30;
FltOffs = -36;
CmpOffs = -42;
TstOffs = -48;
AbsOffs = -54;
NegOffs = -60;
AddOffs = -66;
SubOffs = -72;
MulOffs = -78;
DivOffs = -84;
FloorOffs = -90;
CeilOffs = -96;

D0 = 0; D1 = 1; D2 = 2; D3 = 3;
A6 = 14;
JSRA6 = 4EAEH;

PROCEDURE IeeeDPFix(r : DIEEEReal): LONGINT;
BEGIN
SETREG(D0,r.Low);
SETREG(D1,r.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,FixOffs);
RETURN LONGINT(REG(D0))
END IeeeDPFix;

PROCEDURE IeeeDPFlt(i : LONGINT; VAR r : DIEEEReal);
BEGIN
SETREG(D0,i);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,FltOffs);
r.Low := REG(D0);
r.High := REG(D1);
END IeeeDPFlt;

PROCEDURE IeeeDPCmp(r1,r2 : DIEEEReal) : CmpResult;
BEGIN
SETREG(D0,r1.Low);
SETREG(D1,r1.High);
SETREG(D2,r2.Low);
SETREG(D3,r2.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,CmpOffs);

```

```

RETURN CmpResult(REG(D0))
END IeeeDPCmp;

PROCEDURE IeeeDPTst(r : DIEEEReal) : CmpResult;
BEGIN
SETREG(D0,r.Low);
SETREG(D1,r.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,TstOffs);
RETURN CmpResult(REG(D0))
END IeeeDPTst;

PROCEDURE IeeeDPAbs(input : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,input.Low);
SETREG(D1,input.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,AbsOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPAbs;

PROCEDURE IeeeDPNeg(input : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,input.Low);
SETREG(D1,input.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,NegOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPNeg;

PROCEDURE IeeeDPAdd(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,r1.Low);
SETREG(D1,r1.High);
SETREG(D2,r2.Low);
SETREG(D3,r2.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,AddOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPAdd;

PROCEDURE IeeeDPSub(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,r1.Low);
SETREG(D1,r1.High);
SETREG(D2,r2.Low);
SETREG(D3,r2.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,SubOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPSub;

PROCEDURE IeeeDPMul(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,r1.Low);
SETREG(D1,r1.High);
SETREG(D2,r2.Low);
SETREG(D3,r2.High);
SETREG(A6,MathIeeeDoubBasBase);
INLINE(JSRA6,MulOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPMul;

PROCEDURE IeeeDPDiv(r1,r2 : DIEEEReal;
VAR output : DIEEEReal);
BEGIN
SETREG(D0,r1.Low);
SETREG(D1,r1.High);
SETREG(D2,r2.Low);
SETREG(D3,r2.High);

```

(continued)


```

SETREG (A6,MathIeeeDoubBasBase);
INLINE (JSRA6,DivOffs);
output.Low := REG(D0);
output.High := REG(D1);
END IeeeDPDiv;

PROCEDURE IeeeDPFloor(input : DIeeeReal;
                     VAR output : DIeeeReal);
BEGIN
  SETREG (D0,input.Low);
  SETREG (D1,input.High);
  SETREG (A6,MathIeeeDoubBasBase);
  INLINE (JSRA6,FloorOffs);
  output.Low := REG(D0);
  output.High := REG(D1);
END IeeeDPFloor;

PROCEDURE IeeeDPCeil(input : DIeeeReal;
                    VAR output : DIeeeReal);
BEGIN
  SETREG (D0,input.Low);
  SETREG (D1,input.High);
  SETREG (A6,MathIeeeDoubBasBase);
  INLINE (JSRA6,CeilOffs);
  output.Low := REG(D0);
  output.High := REG(D1);
END IeeeDPCeil;

PROCEDURE CloseIeeeLib;
BEGIN
  CloseLibrary (MathIeeeDoubBasBase^);
  MathIeeeDoubBasBase := NIL;
END CloseIeeeLib;

BEGIN
  IF MathIeeeDoubBasBase = NIL THEN
    MathIeeeDoubBasBase :=
      OpenLibrary (ADR (MathIeeeDoubleName),0D);
  END;
END MathIeeeDouble.

DEFINITION MODULE IeeeDoubleInOut;

  (*****
   (* IEEE Double Precision output functions for the *)
   (* Benchmark compiler. *)
   (* Steve Faiwizewski April 15, 1988 *)
   (*****)

  FROM MathIeeeDouble IMPORT DIeeeReal;

  PROCEDURE WriteIeeeDReal(r : DIeeeReal; n : CARDINAL);
  (* n : number of decimal places *)
  (* (to the right of the decimal point) *)

  END IeeeDoubleInOut.
  IMPLEMENTATION MODULE IeeeDoubleInOut;

  (*****
   (* IEEE Double Precision output functions for the *)
   (* Benchmark compiler. *)
   (* Steve Faiwizewski April 15, 1988 *)
   (*****)

  FROM MathIeeeDouble IMPORT DIeeeReal, IeeeDPFflt, IeeeDPFfix,
    IeeeDPSub, IeeeDPMul;
  FROM TermInOut IMPORT Write;
  FROM LongInOut IMPORT WriteLongInt;

  VAR
    TEN : DIeeeReal;

  PROCEDURE WriteIeeeDReal(r : DIeeeReal; n : CARDINAL);
  VAR
    int : LONGINT;
    r2,

```

```

    frac : DIeeeReal;
    i : CARDINAL;
  BEGIN
    int := IeeeDPFfix(r);
    WriteLongInt(int,1); Write('');
    IeeeDPFflt(int,r2);
    IeeeDPSub(r,r2,frac);
    FOR i := 1 TO n DO
      IeeeDPMul(frac,TEN,frac);
      int := IeeeDPFfix(frac);
      WriteLongInt(int,1);
      IeeeDPFflt(int,r2);
      IeeeDPSub(frac,r2,frac);
    END;
  END WriteIeeeDReal;

  BEGIN
    IeeeDPFflt(10D,TEN);
  END IeeeDoubleInOut.

  DEFINITION MODULE FFP;

    (*****
     (* FFP functions for the TDI compiler *)
     (* Steve Faiwizewski April 15, 1988 *)
     (*****)

  FROM Libraries IMPORT LibraryPtr;
  FROM SYSTEM IMPORT LONGWORD;

  CONST
    FFPMathName = 'mathffp.library';

  TYPE
    FFPReal = LONGWORD; (* This really should be a hidden *)
                        (* type, but the TDI compiler does *)
    CmpResult = [-1..1]; (* not like LONG hidden types *)

  VAR
    FFPMathBase : LibraryPtr;

  PROCEDURE SPFfix(r : FFPReal) : LONGINT;
  (* Truncate an FFPReal into a LONGINT *)

  PROCEDURE SPFflt(i : LONGINT) : FFPReal;
  (* Convert from LONGINT into floating point FFPReal *)

  PROCEDURE SPCmp(r1, r2 : FFPReal) : CmpResult;
  (* Compare two FFPReals *)

  PROCEDURE SPTst(r : FFPReal) : CmpResult;
  (* Compare against 0 *)

  PROCEDURE SPAbs(r : FFPReal) : FFPReal;

  PROCEDURE SPNeg(r : FFPReal) : FFPReal;

  PROCEDURE SPAdd(r1, r2 : FFPReal) : FFPReal;

  PROCEDURE SPSub(r1, r2 : FFPReal) : FFPReal;

  PROCEDURE SPMul(r1, r2 : FFPReal) : FFPReal;

  PROCEDURE SPDiv(r1, r2 : FFPReal) : FFPReal;

  PROCEDURE SPFloor(r : FFPReal) : FFPReal;

  PROCEDURE SPCeil(r : FFPReal) : FFPReal;

  PROCEDURE FFPCleanup;
  (* Close FFP library *)

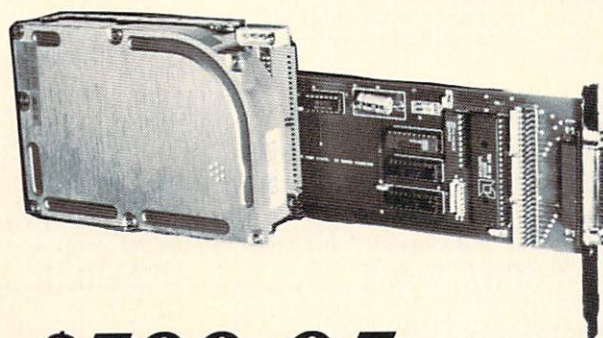
  END FFP.

  IMPLEMENTATION MODULE FFP;

```


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```
(*****
(* FFP functions for the TDI compiler *)
(* Steve Faiwizewski April 15, 1988 *)
(*****)
```

```
FROM Libraries IMPORT OpenLibrary, CloseLibrary;
FROM SYSTEM IMPORT BYTE, ADDRESS, CODE, SETREG,
REGISTER, NULL;
```

```
(*SS- *) (* Disable stack checking *)
(*SP- *) (* Disable generation of procedure entry and *)
(* exit code *)
```

```
CONST
D0 = 0;
D1 = 1;
A6 = 14;
JSRA6 = 4EAH;
SAVEA6 = 2FOEH;
RESTOREA6 = 2C5FH;
```

```
FixOffs = -30;
FltOffs = -36;
CmpOffs = -42;
TstOffs = -48;
AbsOffs = -54;
NegOffs = -60;
AddOffs = -66;
SubOffs = -72;
MulOffs = -78;
DivOffs = -84;
FloorOffs = -90;
CeilOffs = -96;
```

```
PROCEDURE SPFix(r : FFPReal) : LONGINT;
BEGIN
CODE (SAVEA6);
SETREG (D0, r);
```

```
SETREG (A6, FFPMathBase);
CODE (JSRA6, FixOffs);
CODE (RESTOREA6);
RETURN LONGINT (REGISTER (D0))
END SPFix;
```

```
PROCEDURE SPFlt(i : LONGINT) : FFPReal;
BEGIN
CODE (SAVEA6);
SETREG (D0, i);
SETREG (A6, FFPMathBase);
CODE (JSRA6, FltOffs);
CODE (RESTOREA6);
RETURN FFPReal (REGISTER (D0))
END SPFlt;
```

```
PROCEDURE SPCmp(r1, r2 : FFPReal) : CmpResult;
BEGIN
CODE (SAVEA6);
SETREG (D0, r1);
SETREG (D1, r2);
SETREG (A6, FFPMathBase);
CODE (JSRA6, CmpOffs);
CODE (RESTOREA6);
RETURN CmpResult (REGISTER (D0))
END SPCmp;
```

```
PROCEDURE SPTst(r : FFPReal) : CmpResult;
BEGIN
CODE (SAVEA6);
SETREG (D0, r);
SETREG (A6, FFPMathBase);
CODE (JSRA6, TstOffs);
CODE (RESTOREA6);
RETURN CmpResult (REGISTER (D0))
END SPTst;
```

```
PROCEDURE SPAbs(r : FFPReal) : FFPReal;
```

(continued)


```

BEGIN
  CODE (SAVEA6);
  SETREG (D0,r);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,AbsOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPAbs;

PROCEDURE SPNeg(r : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,NegOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPNeg;

PROCEDURE SPAdd(r1, r2 : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r1);
  SETREG (D1,r2);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,AddOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPAdd;

PROCEDURE SPSub(r1, r2 : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r1);
  SETREG (D1,r2);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,SubOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPSub;

PROCEDURE SPMul(r1, r2 : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r1);
  SETREG (D1,r2);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,MulOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPMul;

PROCEDURE SPDiv(r1, r2 : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r1);
  SETREG (D1,r2);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,DivOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPDiv;

PROCEDURE SPFloor(r : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,FloorOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))
END SPFloor;

PROCEDURE SPCEil(r : FFPReal) : FFPReal;
BEGIN
  CODE (SAVEA6);
  SETREG (D0,r);
  SETREG (A6,FFPMathBase);
  CODE (JSRA6,CeilOffs);
  CODE (RESTOREA6);
  RETURN FFPReal (REGISTER (D0))

```

```

END SPCEil;

PROCEDURE FFPCleanup;
BEGIN
  CloseLibrary (FFPMathBase)
END FFPCleanup;

BEGIN
  IF FFPMathBase = NULL THEN
    FFPMathBase := OpenLibrary (FFPMathName,0);
  END;
END FFP.

DEFINITION MODULE FFPTrans;

  (*****
  (* FFP Transcendental functions for the TDI compiler *)
  (* Steve Faiwizewski April 15, 1988 *)
  (*****)

  FROM Libraries IMPORT LibraryPtr;
  FROM FFP IMPORT FFPReal;

  CONST
    FFPMathTransName = 'mathtrans.library';

  VAR
    FFPMathTransBase : LibraryPtr;

  PROCEDURE SPAsin(r : FFPReal) : FFPReal;
  (* ArcSine *)

  PROCEDURE SPACos(r : FFPReal) : FFPReal;
  (* ArcCosine *)

  PROCEDURE SPAtan(r : FFPReal) : FFPReal;
  (* ArcTan *)

  PROCEDURE SPSin(r : FFPReal) : FFPReal;
  (* Sine *)

  PROCEDURE SPCos(r : FFPReal) : FFPReal;
  (* Cosine *)

  PROCEDURE SPTan(r : FFPReal) : FFPReal;
  (* Tan *)

  PROCEDURE SPSinCos(r : FFPReal;
    VAR OutCos : FFPReal) : FFPReal;
  (* Sine & Cosine. *)
  (* Sine is returned as the function value. *)
  (* Cosine is returned in OutCos. *)

  PROCEDURE SPSinh(r : FFPReal) : FFPReal;
  (* Hyperbolic Sine *)

  PROCEDURE SPCosh(r : FFPReal) : FFPReal;
  (* Hyperbolic Cosine *)

  PROCEDURE SPTanh(r : FFPReal) : FFPReal;
  (* Hyperbolic Tan *)

  PROCEDURE SPExp(r : FFPReal) : FFPReal;
  (* Exponent *)

  PROCEDURE SPLog(r : FFPReal) : FFPReal;
  (* Natural log *)

  PROCEDURE SPLog10(r : FFPReal) : FFPReal;
  (* Log base 10 *)

  PROCEDURE SPPow(x,y : FFPReal) : FFPReal;
  (* x to the Power y *)

  PROCEDURE SPSqrt(r : FFPReal) : FFPReal;

  PROCEDURE SPTieee(r : FFPReal) : REAL;
  (* Convert FFPReal to REAL *)

  PROCEDURE SPFieee(r : REAL) : FFPReal;
  (* Convert REAL to FFPReal *)

  PROCEDURE FFPTransCleanup;
  (* Clean up (e.g. close library) *)

END FFPTrans.

```


C Notes From the C Group

by Stephen Kemp, PLINK ID: SKEMP

Last time we discussed the basic data types that can be defined in C—chars, ints, and floats. This month we will discuss two more advanced object types: arrays and pointers. These two items are closely related and can confuse beginning C programmers.

An array defines a group of data with a single name and type. This is useful when, rather than defining a unique variable for each value, you want one variable to hold more than one value. Almost every data and object type declared in C can be arrayed. Defining an array variable is much like defining any other variable, except the variable name is followed by an indicator enclosed in brackets []. The indicator tells how many elements (or values) this variable should maintain. For example, if we want a variable to hold the vowels of the alphabet, we can define this variable:

```
char vowels(6);
```

Since vowels are letters, we use the appropriate data type, char. (Remember, the letters are contained in the ASCII character.) Our variable name, "vowels," follows the data type. This variable must maintain six elements (a, e, i, o, u, and y). By enclosing this number in brackets following the variable name, the compiler reserves six characters to be referenced by the name "vowels." The individual elements of an array can be referenced by indicating a subscript (index) attached to the variable name in brackets. Variable arrays are typically identified by data type; thus, "vowels" is a character array. Furthermore, since our

variable requires only one subscript to reference individual elements, "vowels" is a one-dimensional, character array.

Once an array variable is defined, you can use it in your program. The following program statements show how to initialize a variable with vowels:

```
vowels(0) = 'a';  
vowels(1) = 'e';  
vowels(2) = 'i';  
vowels(3) = 'o';  
vowels(4) = 'u';  
vowels(5) = 'y';
```

Each of these statements identifies one element of "vowels" by indicating a subscript in the brackets after the variable name. Note that all array dimensions in C start with element zero. This point cannot be stressed enough. I can almost guarantee that every C programmer has made the mistake of trying to reference an element based on the array size instead of array size minus one. If we try to assign a value to `vowels[6]`, an error can occur that might be hard to trace (depending on what part of memory was changed). Remember, start with element 0 and end with size-minus-one.

As mentioned earlier, "vowels" is a one-dimensional array of characters. It is possible, and quite common, to define multi-dimensional arrays in C. Although the concept might be difficult to grasp, multi-dimensional arrays are actually arrays within arrays.

Think about trying to define a variable to hold a tic-tac-toe board. Although we can define a one-dimensional array of 9 elements, the "rows/columns" format of a tic-tac-toe board is a perfect example of a two-dimensional array. It is actually an array with three elements, and each element is an array with three elements.

In our vowels example, suppose we want to keep the vowels in upper and lower case letters. The array needs six rows (six vowels) and two columns (upper and lower case). To define this variable, we use this declaration:

```
char vowels(6)(2);
```

Notice that the number of rows is indicated first and is followed by the number of columns. Each number is enclosed in its own set of brackets. You may be tempted to use only one set of brackets and separate the dimensions by commas, like `vowels[1,1]`. Some languages support array subscripts in this manner, but C generates an error during compilation if you use this format.

Simple arithmetic shows that we have now defined the twelve elements necessary for our variable (6 rows * 2 columns = 12 elements). The following statements show one way we can initialize our variable:

```
/* The upper-case vowels of the  
alphabet */  
vowels(0)(0) = 'A';  
vowels(1)(0) = 'E';  
vowels(2)(0) = 'I';  
vowels(3)(0) = 'O';  
vowels(4)(0) = 'U';  
vowels(5)(0) = 'Y';
```

(continued)

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/* The lower-case vowels of the alphabet */

```
vowels(0)(1) = 'a';  
vowels(1)(1) = 'e';  
vowels(2)(1) = 'i';  
vowels(3)(1) = 'o';  
vowels(4)(1) = 'u';  
vowels(5)(1) = 'y';
```

Again, although we indicated six rows by two columns, each dimension subscript starts with element 0 and ends with the array size minus one. When referencing the individual elements of a two-dimensional array, the "rows" subscript is indicated first and followed by the "cols" subscript (as in the variable declaration). The rows of vowels are referenced with a subscript of zero through five; the columns are referenced with a subscript of 0 or 1. This may be repetitive, but you may spend hours debugging a catastrophic code failure only to discover that a subscript mistake caused the problem.

When an element of an array is referenced, the compiler determines the address of the element in question. It does this by adding the array's address of the beginning to an offset into the array. The offset is determined by three things: (A) the number of elements in each succeeding subscript (in multi-dimensional arrays); (B) the value(s) of the subscript(s) indicated in the statement; and (C) the size of the elements' data type. To determine the offset of an element in a two-dimensional array, the compiler uses a formula similar to: $((B1 * A2) + B2) * C$. The letters correspond to the factors mentioned above, while the numbers correspond to the dimension to be used. (One is the first level's dimension; two is the second level's dimension.)

For example, assume the address of the variable "vowels" is at memory location 2000. If we could look at our variable in memory, it would look something like

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
A	a	E	e	I	i	O	o	U	u	Y	y

Using the formula defined previously, the offset of the element vowels[2][1] is $((2 * 2) + 1) * 1 = 5$. As you can see, I've substituted the first indicated subscript for B1, the number of elements in the second subscript for A2, the second indicated subscript for B2. The size of an element (C) is 1 (a character is 1 byte). Adding this offset to the address of the variable causes the character at the memory location 2005 to be referenced. The character at 2005 is the character "i" in the vowels array.

Arrays can have three, four, or even more dimensions. If a compiler limits the number of dimensions you can declare, the limit is usually noted in the documentation. Most programs we discuss will use two dimensions or less, so I will end our discussion of dimensions here.

As indicated in my opening paragraph, the pointer variable type is a close relative of the array. Although some people have trouble understanding them, pointers should be introduced along with arrays. To keep the explanation of pointers as simple as possible, the discussion will be limited to the pointer's relationship with arrays.

Before we can discuss this relationship, we must know what a pointer is. A pointer is a variable that contains the address of (points to) another variable. That's a fairly simple definition, isn't it? Every language you have ever worked with uses pointers, although few languages allow the programmers to define them. C allows you to define address pointers and you will soon discover that they can be very powerful.

Two non-programming examples may help you understand the principle of pointers. Let's say my mother places an apple on the table and leaves a note on the refrigerator saying the apple is on the table. If we were writing a program, the apple would represent a variable, and the note would represent a pointer. When I have the note, I don't have the apple (variable), yet I know where it is located (its address). A pointer tells you where an object is and allows you to reference it without actually duplicating the variable.

For our second non-programming example, imagine a compass. A compass points toward the North Pole. If the North Pole is a variable, the compass (literally) represents a pointer, since it points to the North Pole's location. With a compass's ability to reference the North Pole, you can navigate around the world.

Perhaps these examples are too simple, but they depict three important things about pointers:

1.) A pointer must be initialized before it can be used. In the first example, the note was initialized by my mother. Before she wrote on it, the paper could not indicate where the apple (or anything else) was located. Likewise, a compass is initialized with a magnetic needle. Without that needle, a compass would do nothing but get you very lost.

2.) Having a pointer is not the same as having the variable. It does not declare the "destination" variable, although we can use the pointer to alter the destination variable. Remember, a pointer is a variable that contains the address of another variable. When a pointer is declared, it only defines the program space required to hold an "address value." The pointer does not define the space required to hold the object it points at. The "address value" a pointer contains can be changed, while the "address" of a variable cannot be changed once it has been defined. This is perhaps the hardest concept for new C programmers to understand about pointers.

3.) Pointers reference a particular type of data. This may not be clearly demonstrated in our examples, but it should be noted. When a pointer is defined, you must declare the type of data it points at. In our apple example, you can only find the apple with the note. You cannot use it to find any other object, so it is an "apple pointer." The compass is a "North Pole" pointer. In C programs, you can also declare pointers to characters, integers, etc. Just as any object or data type can be arrayed, you can declare a pointer to any type of object or data that can be declared in C. To expand on these three important facts about pointers, and to demonstrate their relationship with arrays, let's look at an example.

Suppose we want to hold the total number of days that elapse during the year. Because there are 365 days in a year, we will need an integer variable array. Instead of initializing the variable as we did in the "vowels" example, let's

use a pointer. First, we must define a pointer variable along with our array variable:

```
int days(12);      /* an integer array */
int *day_ptr;      /* an integer pointer */
```

The type of variable is declared first, followed by the name (as with all variable declarations). Notice, however, that when you declare a pointer variable, an asterisk (*) appears before the variable name. Although it looks like the data type of our pointer variable is "int," it is actually "int *" (when referring to "int *", we say, "int pointer"). The asterisk tells the compiler to reserve space for an address pointer, in addition to the space of the data type alone (refer back to rule 2). Now we have defined the integer array "days" and the integer pointer "day_ptr". Before we can use the variable "day_ptr", it must be initialized with the address of a variable (see rule 1). This statement initializes our pointer with the address of "days":

```
day_ptr = days; /* initialize the pointer */
```

Note that we did not indicate any subscripts on the variable "days." If the dimensional subscripts are omitted, the compiler assumes you want the address of the array. Furthermore, for multi-dimensional arrays, the compiler generates an address reference if you do not indicate the final dimension's subscript. If we want to initialize a pointer with the address of a particular element in an array, we must include all subscripts and precede the variable name with an ampersand (&). Both the following statements accomplish the goal of initializing the pointer with the same address:

```
day_ptr = days;
          /* the address of days */
```

```
day_ptr = &days(0);
          /* the first element address */
```

Since "days" is an array, the compiler determines that "days" without a subscript is an address reference.

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Additionally, the ampersand preceding "days(0)" (the first element) tells the compiler to compute the address of that element. The address of the first element in an array is the address of the array itself.

The primary relationship of pointers to arrays can be shown when using a pointer to reference an array's values. Consider the following code statements that initialize the "days" array:

```
/* using the array, this is how we
   would initialize */
days(0) = 31;
/*after January, 31 days have passed*/
```

```
days(1) = 59;
/*after Feb, 59 days have passed */
```

```
days(2) = 90; /*after March */
days(3) = 120; /*after April */
days(4) = 151; /*after May */
days(5) = 181; /*after June */
```

```
/* using the pointer, this is one way to
   initialize */
day_ptr(6) = 212; /*after July */
day_ptr(7) = 243; /*after August */
```

(continued)

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```
day_ptr(8) = 273; /*after September*/
day_ptr(9) = 304; /*after October*/
day_ptr(10) = 334; /*after November*/
day_ptr(11) = 365; /*after December*/
```

These statements set the twelve elements of the array "days" to the number of days in the year elapsed after each month. As you can see, these two sets of statements look exactly the same, except we know day_ptr is not an actual array. To explain how this is possible, we refer back to how C works with arrays.

Remember, when an element in an array is referenced, the compiler first determines the address of the element in question. An almost identical process is used when using a pointer as an array. The only difference is that the address added to the offset is not the variable's address; rather, it is read out of the variable.

A pointer can be used like an array because the compiler needs only two things to determine the indicated element: the offset formula for

subscripting and an address from which to start. The formula to determine a one-dimensional array offset is $B * C$, where B is the value of the subscript and C is the data size. Integers are two bytes long, so we can substitute two for C.

Suppose we want to address the "April" element. If we say days[3], the offset $(3 * 2) = 6$ is added to the memory address of "days." If we say day_ptr[3], the same offset is added to the value "contained" in day_ptr. Since day_ptr is initialized with the address of "days," both results are the same.

There is much more to learn about pointers, but I only want to introduce you to their relationship with arrays. If you are still a little fuzzy about the use or value of pointers, don't worry. We will study them in greater detail in the future. For now, spend your time firming your understanding of arrays, especially the points about subscripting. You can learn a lot from experimenting, so don't be afraid to venture out on your own.

•AC•

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PD Serendipity

Insight into the World of Freely Redistributable Software for the Amiga

by C.W. Flatte

The Freely Redistributable software just gets better and better.

Fred Fish 134

BoingThrows

A basketball and a lonely hoop. An irresistible combination. You have to shoot a few free throws. The infamous Amiguy feels the same way, but the backboard is not on the garage; it's on a ray traced image. Watch the Amiguy shoot some hoop in this 50 frame HAM animation, done with Sculpt-3D and animated with Movie (Minor touchups were done with Digi-Paint.) This superb animation took about 325 hours of runtime to generate, yet will run on a 512k Amiga. Another great animation from Marvin Landis. Swiish!

Browser V1.2

I always thought the one thing the Workbench was missing was a facility to work with files on a "by name" basis. It should have allowed the manipulation of any file (even the ones without icons) from the Workbench. Enter Browser. Browser is a Workbench tool, using text-only windows, that makes all the files in the system accessible for executing, copying, moving, deleting, etc. It's called a programmer's Workbench, but I think everyone can use it. It's smooth, clean, neat... Okay, I like it! A lot! Get your hands on the Browser by Peter da Silva. You won't be disappointed. Includes only the executable.

Dme V1.29

(Update to Fred Fish 113)

Programmers! Look! It's Ed!...It's MicroEmacs!...It's DME V1.29!!! DME V1.29 is Matt Dillon's new and improved WYSIWYG editor designed for programmers. It is not a WYSIWYG word processor in the traditional sense, but it includes many features handy to the programming types. Features include arbitrary key mapping, fast scrolling, title-line stats, multiple windows, and the ability to iconify windows (a real neat feature). A super tool!

Find V1.0

Finding a file on a hard disk packed with level upon level of directories and files can be like searching for a needle in a haystack. Your explorer has arrived... Find V1.0. Find is a utility which searches for files that satisfy a given boolean expression of attributes. Starting from a root pathname, Find searches recursively down the hierarchy of the file system and reports to you that file's exact location, very much like the Unix find program. Find is by Rodney Lewis, and includes the source.

Library

Have you ever wished you had a database program that was like an electronic scratchpad? Library, by Bill Brownson, just may be what you're looking for. This demo version of this shareware program stores textual information without regard to structure or content. The real beauty of this program is that it allows complicated searching for specific patterns. Written in assembler, for speed and includes only the executable.

SmartIcon V1.0

This shareware program by Gauthier Groult is an Intuition objects iconifier. This version is limited to iconifying windows, which is still very handy. It adds a new "iconify gadget" to each window, which, when clicked on, iconifies the window into an icon in the ram disk. (Shhh! Don't tell anyone, but C.W.'s sources at Commodore tell me this type of program will be implemented in Workbench 1.4.) Includes only the executable. The source, however, is available from the author.

Fred Fish 135

TeXF

TeX is one of the most powerful page composition packages available. It can handle large selection of fonts. But, where do you get these fonts, and how can they be converted to Amiga screen fonts? Fred Fish 135 is dedicated to TeX fonts for the Amiga with a selection of 78 TeX fonts. The disk also includes a conversion program to convert the TeX fonts to Amiga fonts. There are 22 different fonts at various sizes, ranging from 15 pixels high to more than 150 pixels. The conversion program can also be used with the fonts distributed with AmigaTeX. Boy, that's over 1000 fonts to use with other Amiga programs! Wow! This font extravaganza is by Ali Ozer. Thanks Ali!

(continued)

Fred Fish 136

AsmToolBox

Does 68000 assembly language tickle your palate? If so, try this assembler "toolbox" created to make interfacing between assembler programs and AmigaDOS easy. By Warren Ring, from his *Amazing Computing* column, "The Big Picture." Includes the source.

Bison

Nope, it's not an animal you can be find grazing on the Great Plains; it's replacement for unix "yacc" command. This version is from the GNU (GNU is Not Unix) effort. It is a port of the latest GNU version, done by William Loftus, with the goal of preserving all Bison's current features. Includes the source and testing program "calc". By Bob Corbett and Richard Stallman.

Iff2Pcs V1.1

(Update to Fred Fish 122)

Create your own puzzles with Iff2Pcs, an

interactive puzzle program. IffPcs takes any IFF file containing up to 16 colors and breaks it up into squares to make a puzzle which the user can then piece back together again. Very slick! Another great, by Ali Ozer.

Paste

Paste it!, with this version of the Unix paste utility. Paste concatenates corresponding lines of specified files into a single output line (horizontal or parallel merging). Alternately, Paste concatenates into alternate lines (vertical or serial merging). Paste, by David Ihnat, includes the source.

YaBoingII

(update to Fred Fish 36)

Study animation and game programming with this game demonstrating hardware sprite usage, including collision detection. Includes a well-documented source listing. Originally by animation master Leo Schwab; updates by Ali Ozer.

Zoo V1.71

(Update to Fred Fish 108)

Are you tired of wasting your time with Arc? Don't monkey around...use Zoo. Zoo is a file archiver, much like "arc" in concept, but different in its implementation and user interface. Includes many features arc lacks (such as file/pathnames up to 255 characters in length). Zoo is originally by Rahul Dhesi, with the Amiga port by Brian Waters. Includes only the executable.

That's about all I have time for this month, but I am way behind on my column. I still have to cover Fred Fish 137 to 146. That's right, 146! Check out the PDS catalog for more on these new disks. There are some great things happening in the Amiga's Freely Redistributable Software Library!

Until next month,
Gotcha!

—C.W. Flatte

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READERS



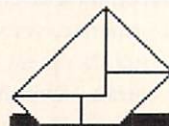
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Hot on the Shelves

by Michael T. Cabral

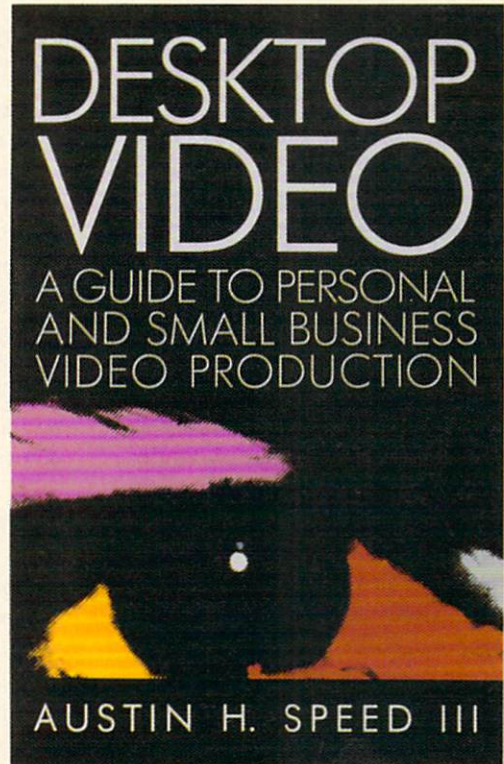
Extra! Extra! Read All About Desktop Video!

Desktop video, the eagle that's been circling the peak of the home computer market for some time now, has finally landed. After paying its dues as resident buzzword, DV can now proudly ruffle its feathers and perch alongside desktop publishing, word processing, and other entrenched applications. One sure sign of this acceptance to the high nest is a textbook. In ***Desktop Video: A Guide to Personal and Small Business Video Production*** by Austin H. Speed III, desktop video now has a bulky 276-page book to call its own.

The text is carved into three sections, moving deliberately from basic equipment and definitions to hands-on applications. The first chunk of 104 pages covers the hardware and software you need to get a desktop video project off the ground. Everything, from camcorders to audio digitizers, from lighting to video editors, is covered. Amigaphiles meet up with a lot of old friends along the way, including Digi-View, Deluxe Video, D-Paint, Aegis Animator, Soundscape, and the Easy! graphics tablet. The Amiga itself is given four pages, more than the Mac and and IBM PC snippets combined. Speed even crawls out on a limb for the Amiga, noting that the Amiga "will be a better general purpose tool than some of the products that come from the video product companies."

The "how-to's" for all that fancy equipment take up most of the next 70 pages. Planning, scripting, storyboarding, scheduling and even budgeting are all outlined. And once all the brain work is done, you're ready to leap to the real thing: shooting video footage. Speed walks through basic camera techniques and slowly leads up to editing, animation, audio recording, and titling. In this section, the Amiga again gets plenty of air play.

The final section traces three real-life desktop video projects. The equipment from part one and the techniques of part two show how well they fit together in this third section. An animated home video, a promo piece, and a clip tossed together with little planning bring out the flexibility and capability of desktop video. A handy glossary of DV terms and a complete script (in the form of an appendix) round out Speed's tidy, informative discussion. Wondering what Speed uses for his DV work? Why an Amiga, of course!



***Desktop Video:
A Guide to Personal and Small Business
Video Production***

\$14.95

Harcourt, Brace, Jovanovich Publishers
Orlando, FL 32887

(continued)



A Frosty Cooler

On a drippy humid, sun-drenched, August afternoon when the thermometer sweats past the hundred degree mark, winter doesn't sound all that bad. A inch or two of cool, refreshing snow never hurt anybody right? Unfortunately, you can't squeeze even a single flake from a baked August dog day. StarSoft Development is out to change all that—at least in your imagination and your joystick hand—with a chilly action/adventure game titled **FROST BYTE**.

You control Hickey, a tough little guy...er Kreezer... who literally tumbles his way across the icy tundra of planet Cosmia. Hickey and his fellow freezin' Kreezers are rapidly being enslaved by a host of crater-dwelling ghouls. If for no other reason, the ghouls live in craters to keep what's ugly out of sight. If you were a one-eyed, crooked-toothed, green and yellow striped snakey looking character, you'd probably camp out underground, too! The trouble is that the ghouls take out their frustration on the Kreezers.

Hickey, a recent escapee, is the Kreezers only hope. He must spring five other captured Kreezers while steering clear of some pretty perturbed ghouls. Ammunition can be scooped up along the way, and colorful, diamond-shaped "sweets" help Hickey move faster, jump higher, and fall further. (Yes, falling is a plus.) Spring platforms also give Hickey the extra boost he may need during the action.

But don't expect an easy emancipation by any means. Many of the ghouls are

deadly on contact and others don't die no matter how nasty Hickey gets. If tons of ruthless, gruesome enemies aren't enough, Hickey is also up against the non-stop "twang" timer. Let the timer run out and the enslaved Kreezer on that level becomes lunch for an underfed ghoul. As the twanger tick-tocks away and nasties pop out of

every corner, you're sure to be sweating more than ever!

FROST BYTE \$29.95

*StarSoft Development Laboratories
3331 Bartlett Blvd.
Orlando, FL 32811*

Breezy Hard Disk Backup

Hard disk backup, as crucial as it is to electronic work, is constantly shoved to the back burner. It just takes too long and it's far too mindless. The ideal backup program has got to fast, safe, and easy to use, and efficient. Otherwise, backups aren't made near as often as they should be. The latest shot at backup euphoria is **HardnFast**, meticulously written by Don Hyde for the ComputerWorks.

If speed is your main concern, how does 10MB in twenty minutes strike you? HardnFast's proprietary format cuts down the floppy disk movement needed to write data and accordingly injects some lightning into the copy process. HardnFast also makes sure you don't waste any time and patience on disk formatting. Disks are formatted automatically as the process rolls along.

Even though the proprietary copy format knocks DiskDoctor out of the picture, HardnFast still follows the old adage of "safety first." All data written to the floppies is read back and compared to the original file. If an error is snagged, HardnFast recovers without a peep and tries to rewrite the bad track. If the track is too far gone, you are prompted to pop in a new disk. HardnFast then doubles back on its own and keeps on crankin'.

Ease of use also made its way into HardnFast. A single icon click launches the program and the friendly Intuition interface is present from that point on. You don't even have to watch the monitor for errors or prompts. Voice announcements let you know when disk swaps or replacements are needed.

Efficiency, the final must-have, also owns a well-laid spot here. HardnFast performs both full and incremental backups. If you've added only two files to a disk since your last backup, HardnFast goes after only the new stuff. The program maintains an automatically updated catalog of all backed up files, so individual files can be restored from either old or new backups. All original dates and timestamps are restored with care, and HardnFast even calculates the number of disks you need for your backup. As a quip in the manual says, "making backups is so easy that you will really do it."

HardnFast \$49.95

*The ComputerWorks
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Disassembly Required

With the release of version 1.0d, **DSM** continues to improve. OTG Software's full-featured MC68000 now includes symbolic disassembly with Wack-readable symbols and true text detection. The generated source code is now completely compatible with the Amiga's old stand-by, *assem*, and expert system disassembly has been incorporated to improve code detection. The manual, a key here, has also been expanded to fifty-five comprehensive pages. Of course, DSM 1.0d still generates that same sharp assembly language source code from any executable Amiga program without overlays.

DSM \$67.50

*OTG Software
200 West 7th St., Suite 618
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Texts: FrchKeys explains how to read function keys from Amiga Basic HackerSh explains how to win the game 'hacker' list68010 guide to installing a 68010 in your Amiga PrinterTip sending escape sequences to your printer StartupTip tips on setting up your startup-sequence file XfmReview list of Transformer programs that work Printer Drivers: Printer drivers for the Canon PJ-1080A, the C10h Prowler, an improved Epson driver that eliminates streaking, the Epson LQ-800, the Gemini Star-10, the NEC 8025A, the Okidata ML-92, the Panasonic KX-P10xx family, and the Smith-Corona D300, with a document describing the installation process. AMICUS Disk 10 Instrument sound demos This is an icon-driven demo, circulated to many dealers. It includes the sounds of an acoustic guitar, an alarm, a banjo, a bass guitar, a bongo, a cello, a car horn, a clarinet, a drum, a electric guitar, a flute, a harp, a piano, a saxophone, a snare drum, a Rhodes piano, a saxophone, a sitar, a steel drum, a steel drum, a vibraphone, a violin, a wailing guitar, a horse whinny, and a whistle. AMICUS Disk 11 C programs drift Intuition-based, CLI replacement manager cpri S-E shows and adjusts priority of CLI processes, S-E ps shows info on CLI processes, S-E videx displays Compuserve RLE pics, S-E AmigaBasic programs pointer pointer and sprite editor program optimize optimization example from AC article calendar large, animated calendar, diary and date book program amortize loan amortizations brush2BOB converts small IFF brushes to AmigaBasic BOB OBJECTS grids draw and play waveforms hilbert draws Hilbert curves medib mad lib story generator mailtalk talking mailing list program meadows3D 3D graphics program, from A CTH article mouseback mouse tracking example in hires mode slot slot machine game tactoe the game switch pachinko-like game weird makes strange sounds Executable programs cp unix-like copy command, E cis screen clear, S-E diff unix-like stream editor uses 'diff' output to files pm chart recorder performances indicator Assembler programs cis screen clear and CLI arguments example Module-2 trails moving worm graphics demo caseconvert converts Module-2 keywords to uppercase Fort Bresenham circle algorithm example Analyze 12 templates for the spreadsheet. Analyze There are four programs here that read Commodore 64 picture files. They can translate Kodak Pad, Doodle, Print Shop and News Room graphics to IFF format. Getting the files from your C-64 to your Amiga is the hard part. AMICUS Disk 12 Executable programs blink "blink" compatible linker, but faster, E-D clean spins the disk for disk cleaners, E-D epsonset sends Epson settings to PAR from menu E-D showbig view hi-res pics in low-res superbitmap, E-D speaktme tell the time, E-D undelete undeletes a file, E-D crvaphdm converts Apple II low, medium and high res pictures to IFF, E-D menued menu editor produces C code for menus, E-D quick quick disk-to-disk nibble copier, E-D quickEA copies Electronic Arts disks, removes protection, E-D bed 1.3 demo of text editor from Microsmiths, E-D C programs popul rotating blocks graphics demo, S-E-D vsprite start a new CLI at the press of a button, like Sidekick, S-E-D VSprite example code from Commodore, S-E-D AmigaBBS Amiga Basic bulletin board prog., S-D Assembler programs star10 makes star fields like Star Trek intro, S-E-D Pictures MountMandelbrot 3D view of Mandelbrot set Star Destroyer hires Star Wars starship Robot robot arm grabbing a cylinder Texts vendors Amiga vendors, names, addresses cardco fixes to early Cardco memory boards cinclode cross-reference to C include files mindwalker clues to playing the game well slideshow make your own slideshows from the Kaleidoscope disk AMICUS Disk 13 Amiga Basic programs Routines from Carolyn Schepner of CBM Tech Support, to read and display IFF pictures from Amiga Basic. With documentation. Also included is a program to do screen prints in Amiga Basic, and the newest BMAP files, with a corrected Converter program. With example pictures, and the SaveLBM screen capture program. Routines to load and play FutureSound and IFF sound files from Amiga Basic, by John Foust for Applied Visions. With	documentation and C and assembler source for writing your own libraries, and interfacing C to assembler in libraries. With example sound. Executable programs gravity Sci Amer Jan 86 gravitation graphic simulation, S-E-D Texts MIDI make your own MIDI instrument interface, with documentation and a hi-res schematic picture. AMICUS Disk 14 Several programs from Amazing Computing issues: Tools Dan Kary's C structure index program, S-E-D Amiga Basic programs: BMAP Reader by Tim Jones FFBUSH2BOB by Mike Swinger AutoRequirer example DOSHelper Windowed help system for CLI commands, S-E-D PETrans translates PET ASCII files to ASCII files, S-E-D C Squared Graphics program from Scientific American, Sept 86, S-E-D crif adds or removes carriage returns from files, S-E-D dpcode decrypts Deluxe Paint, remo ves copy protection, E-D queryWB asks Yes or No from the user returns exit code, S-E vc VisiCalc type spreadsheet, no mouse control, E-D view views text files with window and slider gadget E-D Ong, Spring, yaBong, Zong are sprite-based Boing! style CLIClock, sClock, wClock are window border clocks, S-E-D Texts An article on long-persistence phosphor monitors, tips on making brushes of odd shapes in Deluxe Paint, and recommendations on icon interfaces from Commodore-Amiga. AMICUS Disk 15 The C programs include: br a file printing utility, which can print files in the background, and with line numbers and control character filtering. tm displays a chart of the blocks allocated on a disk. 'Ask' questions an 'execute' file, returns an error code to control the execution in that batch file 'Stat' an enhanced version of AmigaDOS 'status' command. 'Dissolve' random-dot dissolve demo displays IFF picture slowly, dot by dot, in a random fashion. PopCLIZ invoke new CLI window at the press of a key. The executable programs include: 'Form' file formatting program through the printer driver to select print styles DiskCat catalogs disks, maintains, sorts, merges lists of disk files 'PSound' SunRize Industries' sampled sound editor & recorder 'Iconmaker' makes icons for most programs 'Fractals' draws great fractal landscapes and mountain '3D Breakout' 3D glasses, create breakout in a new dimension 'AmigaMonitor' displays lists of open files, tasks, devices and ports in use. 'Cosmooids' version of 'asteroids' for the Amiga. 'Sizzlers' high resolution graphics demo written in Module 2 Texts: 'ansi.txt' explains escape sequences the CON: device responds to. 'Fkey' includes template for making paper to sit in the tray at the top of the Amiga keyboard. 'Spawn' programmer's document from Commodore Amiga, describes ways to use the Amiga's multitasking capabilities in your own programs. AmigaBasic programs: 'Gris' draw sound waveforms, and hear them played. 'Light' a version of the Tron light-cycle video game. 'MegaSol' a game of solitaire. 'Stats' program to calculate batting averages 'Money' "try to grab all the bags of money that you can." AMICUS 15 also includes two beautiful IFF pictures, of the enemy walkers from the las planet in Star Wars, and a picture of a cheetah. AMICUS Disk 16 'Juggler' demo by Eric Graham, a robot juggler bouncing three mirrored balls, with sound effects. Twenty-four frames of HAM animation are flipped quickly to produce this image. You control the speed of the juggling. The author's documentation hints that this program might someday be available as a product. IFF pictures parodies of the covers of Amiga World and Amazing Computing magazines. C programs: 'InputHandler' example of making an input handler. 'FileZap3' binary file editing program 'ShowPrint' displays IFF picture, and prints it 'Gen' program indexes and retrieves C structures and variables declared in the Amiga include file system. Executable Programs: FixHunk2 repairs an executable program file for expanded memory 'ms2mus' converts Music Studio files to IFF standard 'SMUS' format. I have heard this program might have a few bugs, especially in regards to very long songs, but it works in most cases. Amiga version of the 'Missile Command' video game,	This disk also contains several files of scenarios for Amiga Flight Simulator II. By putting one of these seven files on a blank disk, and inserting it in the drive after performing a special command in this game, a number of interesting locations are preset into the Flight Simulator program. For example, one scenario places your plane on Alcatraz, while another puts you in Central Park AMICUS Disk 17 Telecommunications disk which contains six terminal programs. 'Comm' V1.33 term prog. with Xmodem, WModem, term prog. includes Super Kermit 'ATerm' V7.2 Dave Weickler's VT-100 emulator with Xmodem, Kermit, and scripting 'VT-100' V2.6 Tektronix graphics terminal emulator based on the VT-100 prog. V2.3 and contains latest 'arc' file compression 'AmigaHost' V0.3 for Compuserve. Includes RLE graphics abilities & CIS-B file transfer protocol. expansion memory necessary removes garbage characters from modern received files 'FitHunk' filters text files from other systems to be read by the Amiga E.C. 'FixObj' executable version for use with mem expansion article in AC v2.1 'addmem' file documentation and a basic tutorial on un'arc'ing files 'arc' for making 'arc' files E.C. 'arcrc' AMICUS Disk 18 Logo Amiga version of the popular computer language, with example programs, E-D TVText Demo version of the TVText character generator PageSetter Freely distributable versions of the updated PagePrint and PageIFF programs for the PageSetter desktop publishing package. Resizes any CLI window using only CLI commands, E-D FullWindow 3-D version of Conway's LIFE program, E-D Life3d CLI utility to re-assign a WXmodem, WModem disk, S-E-D Defdisk Lotus-compatible worksheet that makes calendars Calendar.WKS SetKey Demo of keyboard key re-programmer, with IFF picture to make function key labels, E-D VPG Video pattern generator for aligning monitors, E-D HP-10C Hewlett-Packard-like calculator, E-D SetPrefs Change the Preferences settings on the fly, in C, S-E-D StarProbe Program studies stellar evolution. C source included for Amiga and MS-DOS, S-E-D ROT G version of Colin French's AmigaBasic ROT program from Amazing Computing. ROT edits and displays polygons to create three dimensional objects. Up to 24 frames of animation can be created and displayed. E-D Scat Like Ing, windows on screen run away from the mouse, E-D DK 'Decays' the CLI window into dust, in Module 2, S-E-D DropShadow2 Adds layered shadows to Workbench windows, E-D AMICUS Disk 19 This disk carries several programs from Amazing Computing. The IFF pictures on this disk include the Amiga Wake part T-shirt logo, a sixteen-color hi-res image of Andy Griffith, and five Amiga Live! pictures from the Amazing Stories episode that featured the Amiga. Solve Linear equation solver in assembly language, S-E-D Gadgets Bryan Catey's AmigaBasicBiblio, Bryan Catey's AmigaBasic household inventory program, S-D Household Jim Shields' Waveform WorkbenchBasic, S-D Waveform John Kennan's AmigaBasic disk librarian program, S-D DisLib Ivan Smith's AmigaBasic subscript example, S-D Subscripts C programs and executables for Harriet Maybeck Tolly's Intuition tutorials, S-E-D String, Boolean Bob Riemann's example for making small C programs, S-E-D Skinny C Make C look like COMAL header file, Makes Emacs function key definitions by Greg Douglas, S-D COMALh Snoop on system resource use, E-D EmacsKey Bird's Tale character editor, E-D AMon 1.1 CLI program shows the size of a given set of files, E-D BTE CLI window utility resizes current window, S-E-D Size WnSize AMICUS Disk 20 Compactor, Decoder Steve Michel AmigaBasic tools, S-D BobEd BOB and sprite editor written in C, S-E-D SpriteMasterII Sprite editor and animator by Brad Kiefer, E-D BitLab Bitler chip exploration C program by Tomas Rokicki, S-E-D FPIC Image processing program by Bob Bush loads and saves IFF images, changes them with several techniques, E-D Bankin Complete home banking program, balance your checkbook! E-D AMICUS Disk 21 Target Makes each mouse click sound like a gunshot, S-E-D Send Simple game of sand that follows the mouse pointer, E-D	PropGadget Harriet Maybeck Tolly's proportional gadget example, S-E EHB Checks to see if you have extra-half-bright graphics, S-E-D Piano Simple piano sound program CeScripts Makes cell animation scripts for Aegis Animator, in AmigaBasic This disk has electronic catalogs for AMICUS disks 1 to 20 and Fish disks 1 to 80. They are viewed with the DiskCat program, included here. AMICUS Disk 22 Cycles Light cycle game, E-D View_Prtntll Views and prints IFF pictures, including larger than screen PrDrvGen2.3 Latest version of a printer driver generator Animatons VideoScope animations of planes and boing ball Garden Makes fractal gardenscapes BasicSorts Examples of binary search and insertion sort in AmigaBasic AMICUS Disk 23 An AMICUS disk completely dedicated to music on the Amiga. This disk contains two music players, songs, instruments, and players to bring the thrill of playing "Big Sound" on your Amiga Instruments a collection of 25 instruments for playing and creating music. The collection ranges from Cannon to Marimba List INSTR program to list the instruments DMCS will not load as well as list the origins for any instrument. Music a collection of 14 Classical pieces 1812Overture The 15 minute classical feature complete with Cannon! Three Amiga Music Players: SMUSPlay MusicCraft2SMUS MusicStudio2SMUS AMICUS Disk 24 Seccrampa A disk sector editor for any AmigaDOS file-structured device, recover files from a trashed hard disk. By David Joiner of MicroIllusions Iconize Reduces the size of IFF images, companion program, Recolor, remaps the palette colors of one picture to use the palette colors of another. Using these programs and a tool to convert IFF brushes to Workbench icons, make icons look like miniatures of the pictures. CodeDemo Module-2 program converts assembler object files to inline CODE statements. Comes with a screen scrolling example AmBug Workbench hack makes the same fly walk across the screen at random intervals. Otherwise, completely harmless. BNTools Three examples of assembly language code from Bryce Nesbitt: 1. SetLace, prog to switch interface on/off. 2. Why, replace AmigaDOS CLI Wny 3. Loadit, prog to load a file into memory until a reboot. (Only the most esoteric hackers will find Loadit useful.) Monolace CLI program resizes Preferences to several colors of monochrome & interface screens. C source is included, works with DisplayPref, a CLI program which displays the current Preferences settings. BoingMachine A ray-traced animation of a perpetual motion Boing-making machine, includes the latest version of the Movie program, which has the ability to play sounds along with the animation. By Ken Otter Daisy Example of using the translator and narrator devices to make the Amiga talk. It is written in C. QuickFix Script-driven animation and slideshow program flips through IFF images. BMon System monitor AmigaBasic program; perform simple manipulations of memory. Moose Random background program, a small window opens with a mouse resembling Bulwinkle saying witty phrases user definable. DGCS Deluxe Grocery Construction Set, simple Intuition-based prog for assembling and printing a grocery list. The Virus Check directory holds several programs relating to the software virus that came to the US from prates in Europe as detailed in Amazing Computing V2.12. Bill Koester's full explanation of the virus code is included. One program checks for the software virus on a Workbench disk; the second program checks for the virus in memory, which could infect other disks. AMICUS Disk 25 Nemesis Graphics demo pans through space towards the mythical dark twin of the sun with wonderful music and space graphics. The KickPlay directory holds text that describes several patches to the Kickstart disk. For Amiga 1000 hackers who feel comfortable patching a disk in hexadecimal, KickPlay offers the chance to automatically do an ADDMEM for old expansion memory, as well as the ability to change the picture of the "Insert Workbench" hand. A program is also included for restoring the correct checksum of the Kickstart disk. KeyBird BASIC prog edits keymap, adjust the Workbench keymaps or create your own.
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8ColorWB

Modifies the Workbench to three bitplanes are used, icons can have eight colors, instead of four, eight-color icons are included. Public domain program "zapicon" or "brush2con" converts eight-color IFF brushes to icons, to use Deluxe Paint to make icons for this new Workbench.

BrushIcon

Converts brushes to icons (bizar doc).

Egraph

Graphing prog reads (x,y) values from a file and displays them on the screen, similar to the same-named Unix program.

Keep 1.1

Message-managing program for telecommunications, lets you save messages from an online transcript to another file, understands the message format of the national networks and several types of bulletin board software. Moves through the transcript and save messages

Kil.fastdir

Speed up directory access, it creates a small file in each directory on a disk which contains the information about the files, will also remove all the "fastdir" files from each directory. by CLIMATE's authors

The LaceWB

Program changes between interface and non-interface Workbench. Previously, you were forced to reboot after changing Preferences to an interfaced screen. This program flips between the normal and extended screen heights.

PW_Utily

A shareware utility for ProWrite users, changes margin settings and font types.

Guru

A CLI program, prints out probable causes for Guru meditations; C source included.

DiskWipe

Latest from Software Distillery, removes files from directories or disk drives, much faster than "delete."

Snow

AmigaBasic: makes snowflake designs.

Mist

Mailing list database.

Softballstats

Maintain softball statistics/ team records.

Dodge

Short Modula-2 program moves the Workbench screen around after a period of time, prevents monitor burn-in.

AMCUC Disk 26

Todor Fay's SoundScape module code from his Amazing Computing articles. The source to Echo, Chord, TX, and VU is included. The Latex and Manx C source code is here, along with the executable modules.

ImageMaker

Interesting tool edits image structures for C, loads & saves C code directly.

Cia2

Update of prog to convert IFF images to PostScript files for printing on laser printers

SDBackup

Hard disk backup prog with Lempel-Ziv compression to reduce the necessary number of disks.

TGB

Prints information about tasks and processes in the system; assembler source is included.

FunBut

Lets a function key act like a rapid series of left mouse button events.

DC

A handy program for people who use an Amiga 1020 5 1/4 inch drive as an AmigaDOS floppy. A Workbench program that sends a DiskChange signal to the operating system: instead of typing "diskchange d2:" over and over again, just click on the icon. C source included.

System config

File makes screen 80 columns wide of text in the Scribble word processor.

Dick2Ram

2 programs to move the Scribble spelling dictionary to and from the RAM disk.

Lexical

Analyzes a text file and gives the Gunning-Fog, Flesch, and Kincaid indices which measure readability.

HexDump

Modula-2 program to display memory locations in hexadecimal.

Tartan

AmigaBasic; design Tartan plaids.

DirMaster

Disk catalog program.

BMP

plays 8SVX sampled sounds in the background while something else is happening in the Amiga, as your Amiga is booting, for example.

ShowPt

CLI program changes your pointer to a given pointer.

AMICUS 26 also

has a collection of mouse pointers, & Workbench program to display them

Fred Fish Public Domain Software

Fred Fish Disk 1:

amigaemo
amiga-term
balls
colorful
dhrystone
dotty
freedraw
gad
gluamem
halforie
halio
lattiip
palette
trackdisk
requesters
speech
speechtoy

Fred Fish Disk 2:

alib
ooc
dbug
make
make2
microemcs
portat
xrf
gotic
roff
ff
cfth
xlisp
banner
bgrep
bison
bm
grip
kermi
MyCLI
mandel
cons
freemap
inputdev
joystick
keyboard
layers
mandelbrot
mouse
one.window
parallel
printer
print.support
proctest
region
samplefont
serial
singlePlayfield
speechtoy
speechdemo
textdemo
timer
trackdisk
compress
dadc
microemcs
mult
scales
separallex
sesterial
sortic
stripic
MVP-FORTH
more
prof
seface
skewb
sparkis
conquest
dhex
fixzap
fixobj
iff
ld
ls
squsq
trek73
yachtic
dpside
amiga3d
sign
ArgoTerm
arrow3d
ic4
iconExec
SetWindow
SetAlarmate
StarTerm

Fred Fish Disk 3:

gotic
roff
ff
cfth
xlisp
banner
bgrep
bison
bm
grip
kermi
MyCLI
mandel
cons
freemap
inputdev
joystick
keyboard
layers
mandelbrot
mouse
one.window
parallel
printer
print.support
proctest
region
samplefont
serial
singlePlayfield
speechtoy
speechdemo
textdemo
timer
trackdisk
compress
dadc
microemcs
mult
scales
separallex
sesterial
sortic
stripic
MVP-FORTH
more
prof
seface
skewb
sparkis
conquest
dhex
fixzap
fixobj
iff
ld
ls
squsq
trek73
yachtic
dpside
amiga3d
sign
ArgoTerm
arrow3d
ic4
iconExec
SetWindow
SetAlarmate
StarTerm

Fred Fish Disk 4:

Prints horizontal banner
A Boyer-Moore grep-like utility
GNU Unix replacement 'yacc', not working.
Another Boyer-Moore grep-like utility
DECUS grep
simple portable Kermit with no connect mode.
Replacement CLI for the Amiga. V. 1.0
A Mandelbrot set program, by Robert French and RJ Mical

Fred Fish Disk 5:

cons
freemap
inputdev
joystick
keyboard
layers
mandelbrot
mouse
one.window
parallel
printer
print.support
proctest
region
samplefont
serial
singlePlayfield
speechtoy
speechdemo
textdemo
timer
trackdisk
compress
dadc
microemcs
mult
scales
separallex
sesterial
sortic
stripic
MVP-FORTH
more
prof
seface
skewb
sparkis
conquest
dhex
fixzap
fixobj
iff
ld
ls
squsq
trek73
yachtic
dpside
amiga3d
sign
ArgoTerm
arrow3d
ic4
iconExec
SetWindow
SetAlarmate
StarTerm

Fred Fish Disk 6:

like Unix compress, a file squizzer
analog clock impersonator
upgraded version of microemcs from disk 2
removes multiple occuring lines in files
demoes using sound and audio functions
Allows changing parallel port parameters
Allows changing serial port parameters.
quicksort based sort program, in C
Strips comments and extra
whitespace from C source

Fred Fish Disk 7:

This disk contains the executables of the game Hack V 1.0.1.

Fred Fish Disk 8:

This disk contains the C source to Hack on disk 7.

Fred Fish Disk 9:

more
MVP-FORTH
prof
seface
skewb
sparkis
conquest
dhex
fixzap
fixobj
iff
ld
ls
squsq
trek73
yachtic
dpside
amiga3d
sign
ArgoTerm
arrow3d
ic4
iconExec
SetWindow
SetAlarmate
StarTerm

Fred Fish Disk 10:

An interstellar adventure simulation game
convert a hex file to binary
Patch program for any type of file.
Strip garbage off Xmodem transferred files.
Routines to read and write if_ format files.
simple directory program
Minimal UNIX ls, with Unix-style wildcarding, in C
file squizzer and unsquizzer
Star Trek game
Doe game.

Fred Fish Disk 11:

slide show program for displaying IFF images with miscellaneous pictures

Fred Fish Disk 12:

Shows a rotating 3 dimensional solid "Amiga sign".

Fred Fish Disk 13:

A Bundle of Basic programs, including:
Jpad
xmodem
ror
bounce
cardf
cubes1
dragon
Eliza
fscope
ha9000
join
loz
minipaint
pena
Readme
sabotage
shuttle
sketchpad
speechspeak
spell
striper
talk
terminal
test
wheels
xmos
xmos2
xmos3
xmos4
xmos5
xmos6
xmos7
xmos8
xmos9
xmos10
xmos11
xmos12
xmos13
xmos14
xmos15
xmos16
xmos17
xmos18
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xmos88
xmos89
xmos90
xmos91
xmos92
xmos93
xmos94
xmos95
xmos96
xmos97
xmos98
xmos99
xmos100

Fred Fish Disk 14:

amiga3d
beep
dex
dimensions
fixzap
gluamem
gi
pohem
shell
termcap
graphics demo, like Unix 'worms'
simple digital clock program for the tie bar
An eight-fold symmetry dazzer program.
Really pretty!
double buffered sequence cycle
animation of a fish
A really nice monopoly game written in AbasiC.
Okidata ML92 driver and WorkBench screen dump program.
A drawing program written in AbasiC.
A fractal program written in AbasiC.

Fred Fish Disk 15:

graphics demo, like Unix 'worms'
simple digital clock program for the tie bar
An eight-fold symmetry dazzer program.
Really pretty!
double buffered sequence cycle
animation of a fish
A really nice monopoly game written in AbasiC.
Okidata ML92 driver and WorkBench screen dump program.
A drawing program written in AbasiC.
A fractal program written in AbasiC.

Fred Fish Disk 16:

A complete copy of the latest developer IFF disk

Fred Fish Disk 17:

The NewTex Digi-View video digitizer HAM demo disk

Fred Fish Disk 18:

AmigaDisplay
dumb terminal program with bell, selectable fonts
Prerelease C-Shell-like shell program, history, loops, etc.
wanders a file tree, displays files, all with the mouse
does on upgrading your Amiga to use a MC68010
notate an N dimensional cube with a joystick
SAY command that talks in Pig Latin
Screen image printer
source, docs, and execut for a Lisp interpreter.

Fred Fish Disk 19:

text-oriented blackjack game
Slides by Jay Miner, Amiga graphics chip designer, showing forwardart of the Amiga internals, in 640 x 400.
test program to test the key mapping routines
Find unused file locks, for programs that don't clean up.

Fred Fish Disk 20:

AmigaToAtari
DiskSalv
Hash
Hd
MandelBrot
MultiTasking
Pack
PortHandler
Random
SetMouse2
SpeechTerm
TexEd
Fred Fish Disk 21
Fred Fish Disk 22

Fred Fish Disk 21:

converts Amiga object code to Atari form
program to recover files from a trashed AmigaDOS disk.
example of the AmigaDOS disk hashing function
Hex dump utility ala Computer Language magazine, April 86
Mandelbrot contest winners
Tutorial and examples for Exec level multitasking
strips whitespace from C source
sample Port-Handler program that performs. Shows BCPL environment
Random number generator in assembly, f or C or assembler.
sets the mouse port to right or left terminal Emulator with speech capabilities, XModem
Demo editor from Microsmith's Charlie Heath

Fred Fish Disk 22:

This is a copy of Thomas Wilcox's Mandelbrot Set Explorer disk. Very good!
This disk contains two new "strains" of microemcs.
version 3.6 by Daniel Lawrence. For Unix V7, BSD 4.2, Amiga, MS-DOS, VMS. Uses Amiga function keys, status line, execute, startup files, more.
By Andy Poggio. New features include <ALT> keys as Meta keys, mouse support, higher priority, backup files, word wrap, function keys.

Fred Fish Disk 23:

A Bundle of Basic programs, including:
Jpad
xmodem
ror
bounce
cardf
cubes1
dragon
Eliza
fscope
ha9000
join
loz
minipaint
pena
Readme
sabotage
shuttle
sketchpad
speechspeak
spell
striper
talk
terminal
test
wheels
xmos
xmos2
xmos3
xmos4
xmos5
xmos6
xmos7
xmos8
xmos9
xmos10
xmos11
xmos12
xmos13
xmos14
xmos15
xmos16
xmos17
xmos18
xmos19
xmos20
xmos21
xmos22
xmos23
xmos24
xmos25
xmos26
xmos27
xmos28
xmos29
xmos30
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xmos32
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xmos34
xmos35
xmos36
xmos37
xmos38
xmos39
xmos40
xmos41
xmos42
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xmos98
xmos99
xmos100

Fred Fish Disk 24:

ezspeak
addbook
amiga-copy
brickout
colorcircles
datedogstar
dynamictriangle
fibuster
dart
haiku
hidden
menu
patch
Orthello
goeandom-circles
rightest
shades
speakspeak
sphere
superpad
suprshr
topography
xmosstrip
triangle

Fred Fish Disk 25:

A graphic version of the game on disks 7 and 8. This is the graphics-oriented Hack game by John Toebes. Only the executable is present.

Fred Fish Disk 26:

UnHunk
Collect code, data, and bus hunk together, allows individual specification of code, data, and bus origins, and generates binary file with format reminiscent of Unix "a.out" format. The output file is easily processed by a separate program to produce Motorola "S-reports" suitable for downloading to PROM programmer. By Eric Back.
C-kermi
Port of the Kermit file transfer program and server.
Ps
Display and set process priorities
Archa
Yet another program for bundling up text files and mailing or posting them as a single file unit.

Fred Fish Disk 27:

ABasic
NewConvertFD
BPlanes
AboutBMaps
LoadLBM
LoadACBM
ScreenPrint
Disassem
DvorakKeymap
Hypocycloids
LinesDemo
MemExpansion
SafeMalloc
ScienceDemos

Fred Fish Disk 28:

ABasic basics by David Addison: Backgammon, Cribbage, Milestone, and Ortelio
Ccp
DECUS 'tpp' C preprocessor, & a modified 'to' that knows about the 'cpl', for Manx C.
Shar
Example of using a ScrollLayer, syncing SuperBMaps for printing, and creating dummy RasPorts.
AegisDraw Demo
Animator Demo
Cc
Enough
Rubik
StringLib
Vt100

Fred Fish Disk 29:

Several shareware programs. The authors request a donation if you find their program useful, so they can write more software.
BBS
FireAnt
FontEditor
MenuEditor
StarTerm3.0
Life
Mandelbrot
MxExample
RmSpeed
Set
Tree
TxEEd
VDraw
Xcon
Tcon

Fred Fish Disk 30:

an Amiga Basic BBS by Ewan Grantham
Amiga art
edit fonts, by Tim Robinson
Create menus, save them as C source, by David Pelron
Very nice telecom. by J. Nangano
Free if requested when ordered with at least three other disks from the collection.

Fred Fish Disk 31:

Life game, uses blitter to do 19.8 generations a second.
Version 3.0 of Robert French's program.
Mutual exclusion gadget example.
Measure relative RAM speed, chip and fast.
Replacement for the Manx "set" command for environment variables, with improvements.
Draws a recursive tree, green leafy tree, not files.
Crippled demo version of Microsmith's text editor, TxEEd.
Full-featured drawing program by Stephen Vermuelen.
Involves CLI scripts from icon
Displays text files from an icon.

Fred Fish Disk 32 Address Calendar DopPlus1 DopPlus2 Executables only: MacView Puzzle ShowHAM Solitaire Spin3 Sword Trails Fred Fish Disk 33 3dstars Bgmap Doutgals DiskMapper MemView Ong Sproing ScreenDump Sdb Stars TermPlus Vti00 Fred Fish Disk 34 Aint Blink Browser Btree Btree2 Calendar Less NewFonts Pr Requester Fred Fish Disk 35 ASendPacket ConsoleWindow DrUtil DrUtil2 FileRequester MacView Plot PopCLI QuickCopy ScrollPi SendPacket SpriteMaker Tracker TriCops 3-D Tsize UnitDef Vitest Fred Fish Disk 36 Acp Clock Csh DietAid Echo FixHunk Fm KickBench Lex TunnelVision Vc Vti00 YaBoing Fred Fish Disk 37 This disk is a port of Timothy Budd's Little Smaltalk system, done by Bill Kinnerley at Washington State University. Fred Fish Disk 38 CSquared FixObj Handler	Extended address book, AmigaBASIC Calendarary program, AmigaBASIC First volume of CLI oriented developer tools 2nd volume of CLI oriented developer tools Views MacPaint pics in Amiga low or high res, no sample pictures, by Scott Evernden. Simulation of puzzle with moving squares. View HAM pictures from CLI. ABASIC games of Canfield and Klondike, from David Addison. Graphics demo of spinning cubes, double-buffered example. Sword of Fallen Angel text adventure game written in Amiga Basic. Leaves a trail behind mouse, in Module-2 3d version of the 'stars' program below. Low-level graphics example scrolls bitmap with ScrollVPort. Double-buffered animation example for BOBs and VSprite. Displays sector allocation of floppy disks. View memory in real time, move with joystick. Bouncing balls demo Ong, with sound effects. Dumps highest screen or window to the printer. Simple database program from a DECUS tape. Star field demo, like Star Trek. Terminal program with capture, library, function keys, Xmodem, CG-B protocols. Version 2.0 of Dave Wecker's VT-100 emulator, with scripts & function Support files for Gimpel's 'Inf' syntax checker PO 'link' compiler linker, faster, better. Updated to FF 18 'browser', in Manx, with scroll bars, bug fixes. b-tree data structure examples Another version of 'btree' Appointment calendar with alarm. File viewer, searching, position by percent, line number. Set of 28 new Amiga fonts from Bill Fischer Background print utility, style options, wildcards. Deluxe Paint-type file requester, with sample. Example of making asynchronous I/O calls to a DOS handler, written by C-A Example of getting the intuition pointer a CON: or RAW: window, for 1.2, by C-A. Walk the directory tree, do CLI operations from menus Another variant of DrUtil. Lattice C file requester module, with demo driver, from Charlie Heath. Views MacPaint pictures in Amiga low or high res, with sample pictures, by Scott Evernden. Simple IFF reader program Soleclick-style program invokes a new CLI, with automatic screen blanking. Devport disk copiers duplicate copy-protected disks. Dual playfield example, from C-A, shows 400 x 300 x 2 bit plane playfield on a 320 x 200 x 2 plane deep playfield. General purpose subroutine to send AmigaDOS packets. Sprite editor, can save work as C data structure. Shareware by Ray Larson. Converts any disk into files, for electronic transmission. Preserves entire file structure. Shareware by Brad Wilson. space invasion game, formerly commercial, now public domain. From Geodesic Publications. Print total size of all files in subdirectories. C preprocessor to remove given #ifdef sections of a file, leaving the rest alone. By Dave Yost VT-100 emulation test program. Requires a Unix system. Unix-like 'cp' copy program Updated version of clock on disk 15. Manx 'csh'-like CLI history, variables, etc. Diet planning aid organizes recipes, calories Improved 'echo' command with color, cursor addressing Fax programs to let them run in external memory. Maps the sectors a file uses on the disk. Docs, program to make a single disk that works like a Kickstart and Workbench. Compuses Fog, Fleisch, and Kincad readability of text files. David Addison ABASIC 3D maze perspective game. Visicalc-like spreadsheet calculator program. Version 2.2 of Dave Wecker's telecom program Ongli style game program shows sprite collision detects	Hp-10c IFFEncode JHDump JH NewStat Reversi Ucodecode VDraw VoiceFilter Window Fred Fish Disk 39 AnsEcho Display Driver Xisp Fred Fish Disk 40 Ahost AmigaMonitor Arc AreaCode Blink Cosmo Dr210 DrUtil DOSHelper PagePrint PopCLI SpriteEdit X-Spell Fred Fish Disk 41 AmigaVenture Csh Dlog DualPlayField GdFile LdXref Lines SelfFont Vti00 Fred Fish Disk 42 This disk contains an Amiga version of MicroGNUEmcs. Fred Fish Disk 43 BasicBoing Blom Btblist Cc Copper InstIFF PopColors SpriteClock ST Emulator WBRun Wild Fred Fish Disk 44 Icons NewIFF RayTracePics ViewLBM Fred Fish Disk 45 Clue Make Pictures Update Whereals Fred Fish Disk 46 Asm CheckModem Egads Jive Jvb ProfMacros ValSpeak Fred Fish Disk 47 3D-Arm Juggler VT-100 Fred Fish Disk 48 Bru Conim Csh Diskperf Du MemWatch Protler	Mimics a HP-10C calculator, written in Module-2 Saves the screen as an IFF file Dumps info about an IFF file BDS C-like CLI shell STATUS-like program, shows priority, processes Game of Reversi, version 6.1 Translate binary files to text, Unix-like programs Drawing program, version 1.14 DX MIDI synthesizer voice filter program Example of creating a DOS window on a custom screen 'echo', 'touch', 'ls', 'cd' written in assembler. Displays HAM images from a ray-tracing program, with example pictures. Example device driver source, acts like RAM: disk XLIsp 1.7, executable only Terminal emulator with Xmodem, Kermit and CIS-B protocols, function keys, scripts, RLE graphics and conference mode. Dynamically displays the machine state, such as open files, active tasks, resources, device states, interrupts, libraries, ports, etc. Popular file compression system, the standard for transmitting files Program that decodes area codes into state and locality. 'link' replacement linker, version 6.5 An 'asterisk' done. Data General D-210 Terminal emulator Windowed DOS interface program, V.1.4 Windowed AmigaDOS CLI help program Prints text files with headers, page breaks, line numbers Starts a new CLI with a single keystroke, from any program. With a screen-saver feature. Version 2, waitrose. Sprite Editor edits two sprites at a time Spelling checker allows edits to files Create your own text adventure programs in AmigaBasic. Version 2.03 of Dillon's C-sh-like shell. Executable only Macro based C debugging package update to FF #2 example from CBM, update to Intuition manual Heath's file requester, with source Cross reference of Lattice 3.10 header files Line drawing demo program Changes font used in a CLI window Version 2.3 of the VT-100 terminal program. AmigaBasic program demos page flipping of a 3D cube Demo copy of B.E.S.T. Business Management System. A list of Amiga Bulletin Board Systems C compiler frontends for Manx and Lattice C A hardware copper list disassembler Converts Instruments demo sounds to IFF sampled sounds Adjust RGB colors of any screen Simple clock is displayed on a sprite above all screens Non-serious Atari ST emulator Lets Workbench programs be run from the CLI Two Unix shell style wild card matching routines Miscellaneous icons New IFF material from CBM for sampled video and music files The famous ray-tracing pictures, from FF#39, now converted to IFF HAM format for 'much' faster viewing. Displays normal and HAM LBM files Clue board game Another 'make', with more features Miscellaneous pictures Updates older disk with newer files from another disk Searches a disk for files of given name Shareware 68010 macro assembler, ROM Kernel Manual compatible 'execute' file program detects presence of modern Gadget editor from the Programmers Network Transforms a file from English to Jive. A binary only copy of Mat's alternate runtime library. Author: Matt Dillon Subset Berkeley 'ms' and 'mm' macros for 'proff' Transforms a file from English to Valley Speak. Simulation of a robotic arm, very good graphics, teaching tool, including C source. Eric Graham's stunning HAM animation of a robot juggler Version 2.4 of Dave Wecker's terminal emulator, with Xmodem and Kermit file transfer protocols Alpha version of a hard disk file archiver Version 1.30 of a terminal emulator with phone directories Version 2.04 of Matt Dillon's Unix 'csh'-like CLI replacement, including Lattice & Manx C source Disk benchmark program for Unix and Amiga Computes disk storage of a file or directory Program to watch for programs that trash low memory. It attempts to repair the damage, and puts up a requester to inform you of the damage. From the Software Distillery. A realtime execution profiler for Manx C programs. Includes C source.	Cycloids DrUtil MultiDef MyUpdate Plot Polygon OMouse Touch Trees Fred Fish Disk 49 Aam BreakOut DiskZap FirstSilicon Missile PerfectSound Sizzlers UnixArc Wombat Fred Fish Disk 51 Bison Compress Cos DisSeed Sq, Usq Fred Fish Disk 52 Assign Fractal Hampoly MxGads Tek4010 VDraw Fred Fish Disk 53 Animations ARCre ARP Compiler Spreadsheet TarSplit Ucodecode Fred Fish Disk 54 Hanoi ISpell Ing Luv MIDITools MoreRows Tilt Fred Fish Disk 55 Csh NewStartups AStartup.asm TWSStartup.asm Palette PipeDevice ScreenSave ShanghaiDemo SoundExample Vspites	Update of electronic spirograph from disk 27 Enhanced version of DrUtil from disk 35 Scans a set of object modules and libraries searching for multiply defined symbols Disk update utility with options for stripping comments from C header files, and interactive verification of the updating process Computes and displays 3 dimensional functions in hires Moire type pattern generator with color cycling Queries whether a mouse button is pressed. This can give a return code that can customize a startup-sequence based on whether a mouse button was pressed. Example of setting the datestamp on a file, using a technique from Commodore-Amiga More extensive version of the trees program on Disk 31 Version 1.1 of a shareware 68000 macro assembler, compatible with the Metacommo assembler. This includes an example startup module and more Motorola mnemonics. A brick breakout game, uses 3-D glasses Version 1.1 of a program to edit disks and binary files A smart CLI replacement with full editing and recall of previous commands A Missile Command-type game, with sound, in assembler Sound editor for a low-cost sound digitizer Graphics demos Ver. of 'arc' for Unix System V machines, in C Version 3.01 of Dave Wecker's terminal emulator GNU for Unix 'yacc', working update to FF4 Update to the file compression program on Disk 6 'Wheel of Fortune'-type game in AmigaBasic Unix-like 'diff' and 'sed' for finding the differences between two files, and then recreating the other, given one file, and the list of differences. Portable versions of the CPM squeeze and unsqueeze Replacement for AmigaDOS 'assign' command in C Makes random fractal terrains Workbench-type demos for making polygons in hires and HAM Example of mutual exclusion gadgets with GadgetText Tektronix 4010 terminal emulator Versions 1.16 and 1.18 of a Deluxe Paint-like drawing program Demo animations with player program for Aegis Animator Creates rename scripts for files with long names, so they can be easily 'arc'd' and un'arc'd Preliminary AmigaDOS replacements for 'break', 'cd', 'chmod', 'echo', 'find', 'ls', 'mkdir' and 'rm' Not fully ported to the Amiga, this is a 68000 C compiler. It will produce simple assembly language output, but needs a lot of work. Update with source of the 'vc' spreadsheet on disk 36 Port of program to split Unix 'tar' archives Utilities to encode and decode binary files for ASCII transmission, expanding them by 35% Solves Towers of Hanoi Problem in it's own Workbench window, by Al Ozer Port of a Unix screen oriented, interactive spelling checker. (Expansion RAM required) by Pace Willison A Screen of lots of bouncing little windows by Leo 'Bols Ewhac' Schwab Displays number of tasks in run queue, averaged over last 1, 5, and 15 minute periods, by William Rucklidge Programs to play/record through the MIDI IFF, by Fred Cassier Program to make the Work Bench Screen larger than normal, by Neil Katrin and Jim Madkraz Program to make your Amiga look like it didn't pass vibration testing, by Leo 'Bols Ewhac' Schwab V2.05 of Matt Dillon's csh like shell (Modified for Manx C), by Matt Dillon, Modified by Steve Drew New C Startup modules: with 1.2 fixes and better quote handling, opens a stdio window, using user specs. by Commodore, posted to BIX by Carolyn Scheppe Change another program's screen colors, by Carolyn Scheppe Allows the standard output of one process to be fed to the standard input of another, by Matt Dillon Save a normal or HAM mode screen as an IFF file, by Carolyn Scheppe Demo of the Activation game Shanghai. A double buffered sound example for Manx C, by Jim Godnow A working vspite example, by Eric Cotton	Vti00 Fred Fish Disk 56 Clipboard ConPackets GetDisks GetVolume Icon2C MergeMem mCAD Fred Fish Disk 57 Replaced by FF97 Due to Copyright problems Fred Fish Disk 58 ASDG-rtd BgView EGraph HyperBase MemClear NewZAP RainBow SMUSPlayers View WBDump Fred Fish Disk 59 Browser Browser2 Clock Dme DropCloth DropShadow FaWB mCAD Robotroff Supermort Fred Fish Disk 60 Various shareware and freeware programs Blitz BlitzFonts HandShake Med PrDrvGen Show Uedit Ueturo Fred Fish Disk 61 ATPacth FillPacth LPacth MicroEmacs PearlFont Terrain Vspites Fred Fish Disk 62 This is a port of the Unix game 'Hack', by the Software Distillery, version 1.0.30. Fred Fish Disk 63 This is a port of the Unix game 'Larn', by the Software Distillery, version 1.2.0B. Fred Fish Disk 64 This is an official IFF specification disk from Commodore, an update to disk 16. Fred Fish Disk 65 Bawk MWB CloseWB Cookie JTime MenuBuilder NewPackets PascalToC Pprep RunBack	V2.6 of Dave's Vti00 terminal emulator with kermit and xmodem, by Dave Wecker Clipboard device interface routines, to provide a standard interface, by Andy Finke Demos of the use of DOS Packets, ConUnit, etc. by Carolyn Scheppe Program to find all available disk device names and return them as an exec list, by Philip Lindsay Program to get volume name of the volume that a given file resides on, by Chuck McManis Reacts an icon file and writes out a fragment of C code with the icon data structures, by Carolyn Scheppe Program to merge the MemList entries of sequentially configured RAM boards, by Carolyn Scheppe An object oriented drawing program, V1.1, by Tim Mooney Extremely useful shareware recoverable ram disk, by Perry Kivrolowitz Displays any IFF picture, independent of the physical display size, using hardware scroll, by John Hodgson Reads pairs of x and y value from a list of files and draws a formatted graph, by Laurence Turner Shareware data management system. V1.5 Walks through the free memory lists, zeroing free memory along the way, by John Hodgson A third-generation multi-purpose file sector editing utility, V3.0 by John Hodgson A Mauser-style rainbow generator, by John Hodgson Two SMUS plays, to play SMUS IFF music formatted files, by John Hodgson A tiny ILLBM viewer by John Hodgson JX-80 optimized wordbench printer that does not use DumpRPort, by J. Hodgson Update to browser program on disks 18 and 34, S-E Another different browser program. E Clock program with fonts, colors, E Dillon text editor V1.22 for programmers, ED Puts pattern on Workbench backdrop, ED Shadows on Workbench windows, E-D Similar to DropCloth, but doesn't work yet, S-D Object-oriented drawing program, version 1.2.2. Much improved over disk 56. Demo of animated pointers on Workbench, S-E-D General compounding/amortization loan calculator, E-D Memory resident file viewer. Very fast. E-D Makes text output faster, E-D Terminal emulator with VT52/VTI00/VT102 support, E-D Mouse-driven text editor version 2.1, E-D Generates printer drivers, version 1.1.S Available from author, E-D Sideways-like IFF viewer, V2.1, E-D Customizable text editor V2.0, E-D Example Uedit setup macros, S-E-D Patches Transformer to work under AmigaDOS 1.2, S-E-D Writes zeroes to free blocks on a disk for security, S-E-D Patch for programs that abort when loading under AmigaDOS 1.2, S-E-D Conroy MicroEmacs V3.80, newer than disk 22, S-E-D Like Topaz, but rounded edges. Generates fractal scenery, S-E-D Makes 28 Vspites, from P&EEdgok This is a port of the Unix game 'Hack', by the Software Distillery, version 1.0.30. This is a port of the Unix game 'Larn', by the Software Distillery, version 1.2.0B. This is an official IFF specification disk from Commodore, an update to disk 16. Unix text processor, like 'awk', Doesn't work, but source is included, S-E-D Example of rerouting Workbench window open calls to another custom screen. Version 1.01, S-E-D Example for closing a custom Workbench screen, S-E-D Generates one-line fortune-cookie aphorisms, S-E-D Build-your-own mouse port clock. Creates C source files for menus, based on text descriptions, S-E-D CBM tutorial on new packets and structures in AmigaDOS 1.2. Pascal to C translator, not so great, S-E-D 'hott'-like FORTRAN preprocessor, S-E-D Starts programs from CLI, allowing CLI window to close, E-D
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Graphit	Program to plot simple functions in 2 or 3 dimensions. by Flynn Fishman	QuickFix	An IFF slideshow and cel animation prog. v0.13. A Finnish game. Also called Go-Moku. v1.0	Marketroid	Another devious sprite oriented demo with lots of "n" jokes. 512K required, includes S. By Leo Schwab	Car	This animation is one of Allen's entries to the Badge Killer Demo Contest. It apparently is an inside joke relating to a well known Amiga's experience with a certain high-end graphics hardware manufacturer. Author: Allen Hastings
Juggler	V1.2 of robot juggler animation. Uses HAM mode and ray tracing. by Eric Graham	RisNolla	Frederick Fish Disk 107	Moves	A ram animation system with three different example animations; Kahnankas, Rooker, & F-15. Kahnankas & Rooker run on a 512K Amiga & show off overhauled HAM mode. Includes an animation player program (movie), animation builder programs (drom, pilom), & a textgraphics display program (vibom). By Eric Graham & Ken Oller	Icons	Some sample animated icons. You might find just the icon for that refugee CLI program you've been meaning to make runable from the WorkBench environment. Author: L. Post
MouseReader	Shreware program to read text files & view IFF files using only the mouse. by William Betz	Cah	V2.07 of Matt Dillon's cah like shell.S.	AMUC Demo	A really neat horizontal scrolling demo that is a 2400 x 200 pixel 32 color IFF picture composed of digiview snapshots of members of the Amiga Users of Calgary, superimposed on a very wide picture of the Calgary Skyline. B. only. By Stephen Vermeulen & Stephen Jeans	Tarot	An AmigaBASIC program written by the author as an exercise for learning BASIC. Contains some nice graphic renditions of tarot cards. Author: L. Post
Spines	Prog to demonstrate curve fitting & ren-dering techniques. by Helene (Lee) Teran	Diff	A util., similar to other common "diff" programs. S. Suite provides ex. code of facilities such as FileIO Requester, XText, DoRequest, & tutorial on how to program the Amiga. Book 1.01.S	Exp_Demo	Demo version of Express Paint 1.1, used to create the scrolling demo picture in the AMUC_Demo drawer on this disk. B. only. By Stephen Vermeulen	Frederick Fish Disk 124	Some sample animated icons. You might find just the icon for that refugee CLI program you've been meaning to make runable from the WorkBench environment. Author: L. Post
Shm	Simple graphics demo, approximately simulates the motion of two interacting pendulums. Includes Source by Chris Ediss	ProSuite	SVTools	Empire	This is a complete rewrite, from the ground up, in Draco, of Peter Langton's Empire game. A multiplayer game of exploration, economics, war, etc. can last months. Played either by local keyboard or through modem. V1.0, shreware, & includes S code. By Chris Gray, original game by Peter Langton	Frederick Fish Disk 125	This animation is Kevin's entry to the Badge Killer Demo Contest. It also has a background music arrangement, requires Sonix to use. By Kevin Sullivan
Frederick Fish Disk 98	16 color terminal program based on Comm V1.34. Includes Macro window, custom gadgets, colored menus, etc. V. Beta 0.18 by Keith Young, comm by D.J. James. E.	MoniDCMP	Let's you monitor the IntuiMessages that pass through an IDCMP window. Prints the message class, mouse coordinates, qualifier values. Great for debugging. S.	Stars	Based on original code by Phil Schwab, has credits longer than the actual demo. Runs on 512K Amiga. B. only. By Hilde Ott	Frederick Fish Disk 126	This animation is Kevin's entry to the Badge Killer Demo Contest. It also has a background music arrangement, requires Sonix to use. By Kevin Sullivan
Access	16 color terminal program based on Comm V1.34. Includes Macro window, custom gadgets, colored menus, etc. V. Beta 0.18 by Keith Young, comm by D.J. James. E.	PrintPop	A util. to send common control settings to a printing device. S.	WireDemo	Demonstrates the Amiga's line drawing speed. Runs on a 512K Amiga. Includes S. By Matt Dillon	Frederick Fish Disk 127	This program is Steve and Tom's entry for the Badge Killer Demo Contest. It creates little dots that bounce around and multiply. Includes source. Author: Steve Hansen and Tom Hansen
Backup	Writes AmigaDOS disks as the backup destination. recovers files from the backup disk. Requires manual decisions on disk structure. by Alan Kent SE	Sectrama	Utilities to recover lost or damaged data from floppies & hard disks. v1.1, an update to FF102. V100 emulator for a Tektronix 4010/4014. (V2.6) update to FF52. S.	MicroEMACS	Version 3.9e of Daniel Lawrence's variant of Dave Corroy's microemacs. This is an update to the version released on disk 93. Also included, for the first time, is extensive documentation in machine readable form. Includes source. Author: Dave Corroy, MANY enhancements by Daniel Lawrence	Frederick Fish Disk 128	This demo is Mark's entry to the Badge Killer Demo Contest. It is quite small for what it does, and won fifth place in the contest. Binary only. By Mark Riley
CCDemo	Din'Cat 2.3, a disk catalog program, demo limited to cataloging 100 files at a time. by Ed Alford, MicroAce Software	Tek	V100 emulator for a Tektronix 4010/4014. (V2.6) update to FF52. S.	Frederick Fish Disk 129	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	Frederick Fish Disk 129	A 68000 disassembler, written in 68000 assembler. Includes source. Author: Greg Lee
HDDriver	WD-1002-05 hard disk controller driver. Card capable of maintaining 3 hard disks and 4 floppies, the driver is capable of only one hard disk. by Alan Kent SE	Zoo	File archiver, like "arc". v1.24b. update to FF87	Amoeba	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	DropCloth	A hard disk backup utility, that does a file by file copy of a combination of a pattern and image, into the WorkBench backup. Version 2.2, shreware, binary only. Author: Eric Levitsky
QBase	Quick-Base, a "Mac-Base Management Utility", define and maintain a maximum of 200 records per file. by Kevin Hamise E.	Machine	A new animation.	BackGammon	A graphical Backgammon game done as an undergraduate A.I. course project. Version 1.0, includes source. Author: Robert Pfister	LeClock	An extremely simple clock program, for interlaced screens only. Includes source. Author: Al Ozer
Thai	Thai language quiz program. Speak or type english/Thai sentences from supplied file. by Alan Kent SE	Sim GPM	A CPM sim, simulates 8080 along with h19 emulation. S.	Bankn	A complete checkbook system offered by the author as shreware. Version 1.3, binary only. Author: Hal Carter	MRBackup	A hard disk backup utility, that does a file by file copy of a combination of a pattern and image, into the WorkBench backup. Version 2.2, shreware, binary only. Author: Eric Levitsky
Frederick Fish Disk 99	A-Render Version 3.3 Ray-Tracing Construction Set for the Amiga Computer by Brian Reed	UUPC	Hook up your Amiga as a usernet node. S.	Frederick Fish Disk 130	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	Paint	A simple screen painting program, written in web. Requires web preprocessing program to rebuild from source. Includes source in web. Author: Greg Lee
Frederick Fish Disk 100	Must see animation, by Leo Schwab	Frederick Fish Disk 110	An optimizing C compiler for the 68000 processor. update to FF53, but not based on the code of that disk.	Frederick Fish Disk 131	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	PrDriver	A printer driver for the Toshiba "3 in one" printer in its Qume (best) mode. Includes source in C and assembler. Author: Rico Mariani
Berserk	Must see animation, by Leo Schwab	Frederick Fish Disk 111	A graphical monitor of cpu, blitter, & memory use. Includes two components: load device, monitors system parameters, & amyload, which is the user interface & display program. by Jeff Keiley SE	Frederick Fish Disk 132	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	SOBackup	A hard disk backup utility. CLI interface only. Does file compression. Version 1.1, binary only. By Steve Drew
Comman	Console handler replacement, provides line editing and command line histories transparent to application prog uses CON: windows. Shreware V1.0, by W. Haves. E.	Frederick Fish Disk 112	AssignDev	Frederick Fish Disk 133	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	Sed	A done of the Unix sed (Stream Editor) program. Includes source. Author: Eric Raymond
WBlander	Workbench display hack game, update of "Rooker" on FF85, now with sound effects. By Peter da Silva. E.	Frederick Fish Disk 113	AssignDev	Frederick Fish Disk 134	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	Keys	A "hot-keys" program that binds keyboard function keys to window manipulation functions (window activation, front to back, moving screens, etc). Includes source. Author: David Cervone
Frederick Fish Disk 101	Circular plane generator for VideoScape3D. Generates a clockwise circular polygon with the specified number of vertices. V1.0 by T. Flynn SE	Frederick Fish Disk 114	AssignDev	Frederick Fish Disk 135	This demo of Space Invaders is one of the best freely redistributable games for the Amiga to date. Unlike many commercial games, it even works correctly in a multitasking environment (by not requiring you to reboot just to play a game). Highly recommended! Binary only. Author: LateNight Developments	Frederick Fish Disk 136	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters
IconAssembler	Change Workbench icons with IFF-brush files by Stefan Lindahl E	Frederick Fish Disk 115	AssignDev	Frederick Fish Disk 136	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters	Evo	Human evolution bytural with source. By S. Bonner
Microspell	Standalone spelling checker scans text files and reports errors. 1000 common word list, 43,000 word main dictionary with multiple user dictionary support. Interfaces with MicroEMACS 3.9, with an emacs macro to step through the source file, stopping at suspect words and allowing the user to option. V1.0 by Daniel Lawrence, SED	Frederick Fish Disk 116	AssignDev	Frederick Fish Disk 137	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters	Hp	A noie RPN calculator prog, supports calculations with binary, octal, decimal, hex, float, and complex numbers. Other features include 32 registers for storing data and transcendental functions. V1.0, includes source. Author: Steve Bonner
Mid	mid library and utility set. Includes Mid monitor, routing utility, status utility, and more. by Bill Barton SED	Frederick Fish Disk 117	AssignDev	Frederick Fish Disk 138	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Pshttp	Postscript Interpreter reads and previews files on screen. by Greg Lee S(sassy)E	Frederick Fish Disk 118	AssignDev	Frederick Fish Disk 139	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
StartUps	Three C startup file replacements for standard AmigaDOS and LStartup. Options include (1) BothStartup, for the WorkBench programs or CLI programs with or without command line parameters. (2) WBSStartup, for WorkBench programs or CLI programs that require no command line parameters. (3) CLISStartup, for CLI programs that require command line parameters but do not need to be WorkBench runable. by Bryce Nesbitt SE	Frederick Fish Disk 119	AssignDev	Frederick Fish Disk 140	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Frederick Fish Disk 102	Machine independent macro based C de-bugging package. Update FF41, by F Fish profiling support by Binayak Banerjee SE	Frederick Fish Disk 120	AssignDev	Frederick Fish Disk 141	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Match-stuff	Heavy duty text pattern matching stuff. Includes simple match text replacement capability. By Pete Goodave	Frederick Fish Disk 121	AssignDev	Frederick Fish Disk 142	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Sectrama	Recover lost or damaged data from floppy or hard disks or repair a damaged volume. by David Joiner E	Frederick Fish Disk 122	AssignDev	Frederick Fish Disk 143	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
SilCon	Smart input line interpreter with window for full editing. Update FF50 by P. Goodave. E	Frederick Fish Disk 123	AssignDev	Frederick Fish Disk 144	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Xcon	Use icons to call up scripts containing CLI commands. V2.0 update of FF31 by Pete Goodave E	Frederick Fish Disk 124	AssignDev	Frederick Fish Disk 145	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Frederick Fish Disk 103	Library and test prog. implement routines for creating and using trees held in memory. S.	Frederick Fish Disk 125	AssignDev	Frederick Fish Disk 146	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
ArTrees	Library and test prog. implement routines for creating and using trees held in memory. S.	Frederick Fish Disk 126	AssignDev	Frederick Fish Disk 147	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Calc	A programmable RPN calculator.	Frederick Fish Disk 127	AssignDev	Frederick Fish Disk 148	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Orel	A C cross ref. prog. S.	Frederick Fish Disk 128	AssignDev	Frederick Fish Disk 149	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
DskKwik	A pair of progs. allows you to save files to one or more floppies for quick loading. Doesn't store Dos format. A prog. to improve control and handling of the material on all disks in "CLI-area".	Frederick Fish Disk 129	AssignDev	Frederick Fish Disk 150	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
IntuiDos	A text import util. for MicroFiche File (demo on FF 89) and updates to some PD disk library databases.	Frederick Fish Disk 130	AssignDev	Frederick Fish Disk 151	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
IFF-Update	A text import util. for MicroFiche File (demo on FF 89) and updates to some PD disk library databases.	Frederick Fish Disk 131	AssignDev	Frederick Fish Disk 152	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Pack-It	Takes all files the files and dirs. on a disk & packs them into a single file. for modem.	Frederick Fish Disk 132	AssignDev	Frederick Fish Disk 153	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Sol	Amiga version of solitaire.	Frederick Fish Disk 133	AssignDev	Frederick Fish Disk 154	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Frederick Fish Disk 104	AnalCalc is a large and powerful spreadsheet prog.	Frederick Fish Disk 134	AssignDev	Frederick Fish Disk 155	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
AnalCalc	AnalCalc is a large and powerful spreadsheet prog.	Frederick Fish Disk 135	AssignDev	Frederick Fish Disk 156	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
AsmProgs	Misc. assembly tools. Includes some S. BasicProgs	Frederick Fish Disk 136	AssignDev	Frederick Fish Disk 157	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
BasicProgs	Misc. assembly tools. Includes some S. BasicProgs	Frederick Fish Disk 137	AssignDev	Frederick Fish Disk 158	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Bison	A replacement for unix " yacc" command. S.	Frederick Fish Disk 138	AssignDev	Frederick Fish Disk 159	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Dmouse	Another prog in the tradition of display hacks". S.	Frederick Fish Disk 139	AssignDev	Frederick Fish Disk 160	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
FlamKey	Allows keyboard and mouse inputs to be locked until a password is entered.	Frederick Fish Disk 140	AssignDev	Frederick Fish Disk 161	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
GravityWars	Game of planets, ships and black holes. v2.0 update to FF84.	Frederick Fish Disk 141	AssignDev	Frederick Fish Disk 162	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
po2C	A util. to write a C-lang definition to mimic the intuition pointer.	Frederick Fish Disk 142	AssignDev	Frederick Fish Disk 163	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Pene-et-Fix	Ex. of creating & using reentrant processes. S.	Frederick Fish Disk 143	AssignDev	Frederick Fish Disk 164	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Record Replay	Similar to "Journal" v2.0 update to FF95.	Frederick Fish Disk 144	AssignDev	Frederick Fish Disk 165	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Frederick Fish Disk 106	Shreware function key editor, v1, update to FF89. Source avail. from author (Anson Mah).	Frederick Fish Disk 145	AssignDev	Frederick Fish Disk 166	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
Function	Shreware function key editor, v1, update to FF89. Source avail. from author (Anson Mah).	Frederick Fish Disk 146	AssignDev	Frederick Fish Disk 167	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		
MoreArt	A small selection of some Amiga artwork.	Frederick Fish Disk 147	AssignDev	Frederick Fish Disk 168	Shreware disk cataloger, V1.1, update of FF108, new features and enhancements. Binary only. By Greg Peters		

PaEdit	A pattern editor for creating patterns to input to the Amiga SetAR macro call. This call sets the area fill pattern for the area filling graphics (RectFill, AreaDraw, etc). Includes source. By: Don Hyde.	YaBoingli	A game program demonstrating hardware sprite usage, including collision detection. Update of FF36. Includes source. Author: Ai Ozer, based on original by Les Schwab.
QMan	Mandelbrot generator written partially in assembly. for speed. Includes source. By: Steve Bonner.	Zoo	File archiver, much like 'arc' in concept, but different in implementation and user interface details. Includes features that 'arc' lacks (such as filepaths names up to 255 characters in length). V1.7.1, update of FF106. Binary only. Author: Rahul Dhoni, Amiga port by Brian Waters.
Fred Fish Disk 131		Fred Fish Disk 137	
Dic	Copies disks like Maudsler, but multi-tasks. Replaces display and format (smaller than ether). Inclusion interface. Includes source. Author: Tomas Rokicki.	Ct	Program to display images from a CT scanner, along with several interesting sample images of scans of real people, including a skull, brain, heart, and spine. Each image is 256 by 256 pixels in 2048 gray scale. The display software, though it has a primitive user interface, is quite powerful, including functions like convolutions, averaging, laplacians, unsharp masking, edge detection, gradients, etc. Binary only. Author: Jonathan Herman.
HyperBase	Shareware database management system. V1.6. Binary only, source available from author. FF58 update. By: Michael MacKenzie, Marc Mengel, & Craig Norborg.	Jeanskoon	Miscellaneous icons created for AMUG's monthly newsletter disk. Submitted by Stephen Vermeulen.
Life	A new version of Tomas's ancient Life game, with a new macro language for setting up patterns, good examples. Includes source. Author: Tomas Rokicki.	Muncho	A cute little program which plays a digitized sound sample when you insert or remove a disk from your drive. If you don't like the sounds, you can replace them with your own. Binary only. By: Andrew Wark.
Mackie	A PopC replacement that draws pretty lines on the screen in blinking mode. Includes source. Author: Software Wizards' enhancements by Tomas Rokicki.	St	Update to the SetIcon Type prog. on FF107. V1.10.
Mg1b	A version of Mg1b with an AREXX port and other improvements by Tomas Rokicki. Define macros & bind them to function keys in startup file. Includes source. Author: Various; enhancements by Rokicki.	VGad	A new gadget editor that takes two pictures of the window and its gadgets, one being the normal gadget state and the other being the fully selected state, then merges the data and converts it to source code. V1.0, binary only. Author: Stephen Vermeulen.
WFrags	Another version of Frags, this pops up a little window that updates occasionally. Necessary for developers who wonder what their program is doing to memory. Includes source. Author: Tomas Rokicki.	VirusX	A boot sector virus check program that runs in the background and automatically checks all inserted disks for a nonstandard boot sector. Such disks can optionally have their boot sector rewritten to remove the virus. Includes source. Author: Steve Tibbitt.
Fred Fish Disk 132		VLabel	Program to print fancy customized disk labels. Combines an FF picture and up to 50 lines of text (which may be placed arbitrarily in any font or point size) then print the result. The FF picture can be virtually any size (up to 1008 by 1000). It will also print labels from a batch file produced by SuperBase. V1.20, binary only. By: Stephen Vermeulen.
Senserk	Animation, a "must see" for every Amiga user, and ranks with "Juggler" as a premier demo for the Amiga. The difference between this distribution, and FF100, this one includes "source", use it as an example for creating animations. Fred Fish felt it was appropriate to have at least one animation that was available at the "source code" level. Author: Leo Schwab.	Fred Fish Disk 138	
Fred Fish Disk 133		AmigaLine	A series of various technical notes for Amiga programmers. Author: Bryce Nesbitt.
Gorman	Shareware replacement for the standard console handler, provides line editing and command line histories completely transparent to any application program that uses CON: windows. V1.1, binary only, update FF100. New features include additional editing keys, fast search keys, undo key, clear history command, and more. Author: William Hawes.	Dif	Program that uses the same algorithm as the Unix diff program and also produces context diffs, suitable for use with patch. Binary only. Author: Unknown (Docus Cofit?)
Crc	Two programs useful for generating 16-bit CRC listings of the contents of disks, and verifying that a given disk's files still compute to the same CRC'd as listed. V1.0, binary only. Author: Don Kirkend.	Foreach	A simple but useful program that expands a wild card file specification and then invokes the specified command once per expanded filename, with the expanded filename as the command argument. Includes source. Author: Jonas Fyge.
CrcLists	Complete CRC check files for FF1-128 using the Crc program included on this disk. These were made directly from Fred's master disks. Author: Fred Fish.	MacFont	A conversion tool to convert Mac fonts to Amiga fonts. Binary only. Author: John O'Neill and Rico Mariani.
Overcan	Patches the Intuition library so that sizable windows with MaxHeight of 200 (400 in interface) and screens with Height of 200 (400 in interface) will take advantage of the PAL overcan capability of Intuition V1.2. Useful only for European users who wish to run software written for the US market, without modifying the applications, but still using the additional space. Includes source. Author: Ari Freund.	ModulaTools	Various useful routines for those programming in Modula on the Amiga. Update to version on disk 84. Includes source. Author: Jerry Mack.
Fred Fish Disk 134		Vt100	Two new versions of Dave's vt100 terminal emulator. One version, based on vt100 2.6, has been enhanced by John Barsinger to include an iconify feature, add full 132 column support using overcan, and other features (binary only). The second version is release 2.8 of the mainstream version of vt100, as enhanced and supported by Tony Sumrall. Includes source. By: Dave Wecker.
BoingThrows	50 frame HAM animation done with Sculpt-3D, and DigPlan. The animation took about 325 frames of runtime to generate. By: Marvin Landis.	Fred Fish Disk 139	
Browser	Workbench tool, using text-only windows, makes all files in the system accessible for executing, copying, moving, renaming, deleting, etc. Billed as a "programmers workbench". V1.2, binary only. BY Peter da Silva.	AmiCon	An enhanced and debugged version of AmiCon 2.3 from FF113. Includes source. Author: Steve Sampson, Rich Schaefer, Christian Balzer.
Dme	V1.23 of Matt's text editor. Simple WYSIWYG editor designed for programmers. Arbitrary key mapping, fast scrolling, line-line statistics multiple windows, & ability to iconify windows. FF113 update, includes source. By: Matt Dillon.	ListScanner	A nice little utility to display all the ExecLists. Similar to Xplor utility FF73. Includes source in assembler. Author: Heiko Rath.
Find	Utility searches for files that satisfy a given boolean expression of attributes, starting from a root pathname and searching recursively down through the hierarchy of the file system. Like the Unix find program. V1.0, includes source. By: Rodney Lewis.	ProCalc	Simulates HP-11C programmable calculator. Both English & German versions. Shareware, binary only. Author: Gotz Muller.
Library	Demo version of a shareware program that stores textual information without regard to structure or content, and allows complicated searching for specific patterns. Written in assembler for speed, binary only. Author: Bill Brownson.	RemLib	Removes a specified library (if currently unused) or displays some info on all available libraries. Includes source in assembler. Author: Heiko Rath.
SmartIcon	Shareware Intuition objects iconifier. V1.0 is limited to iconifying windows, adds a new "iconify gadget" to each window, that when clicked, iconifies the window into an icon in the ram: disk. Binary only, source available from author. Author: Gauthier Groult.	TurboBackup	A fast mass floppy disk duplicator with enforced verify mode to prevent errors. V1.0, binary only. Author: Steffen Stempel and Martin Kopp.
Fred Fish Disk 135		WAranger	Sends a window, identified by its name, to the front or back, without selecting it. Useful with AmiCon. Works on all screens. Includes source in assembler. Author: Heiko Rath.
TeXF	A selection of 78 TeX fonts, with a conversion program to convert them to Amiga fonts. 22 different fonts at various sizes, ranging from 15 pixels high to more than 150 pixels. Conversion program can also be used with the fonts distributed with AmigaTeX, yielding an additional 1000+ fonts for use without Amiga programs. V2.5, binary only. By: Ai Ozer.	WheelChair:Sim	A wheelchair simulator developed as a project for the Technical Resource Centre and the Albert Children's Hospital, to allow the matching of a wheelchair joystick to a child's handicap and allow the child to practice using the chair in a safe (simulated) environment. Binary only. Author: Unknown, submitted by Dr. Mike Smith.
Fred Fish Disk 136		Fred Fish Disk 140	
AsmToolBox	Assembler "toolbox" created to make interfacing between assembler programs and AmigaDOS easy. With source. By: Warren Ring.	SBProlg	Volume 1 of the 2 volume Story Brook Prolg (SBP) distribution, V2.3.2. This volume contains the executables and libraries. Volume 2, on FF141, contains the C and Prolg source code. Authors: Logic Programming Group at SUNY, Story Brook Amiga port by David Roch and Scott Evernden.
Bison	A replacement for unix 'yacc' command. From the GNU (GNU is Not Unix) effort. Port of the latest GNU version, by William Loftus, with the goal of preserving all of bison's current features. Includes source & test pro. "cac". By: Bob Corbett and Rich Stallman.	Fred Fish Disk 141	
H2Pcs	Interactive puzzle prog. takes any FF file containing up to 16 colors, and breaks it into squares to make a puzzle the user can then piece back together again. V1.1, update of FF122, includes source. By: Ai Ozer.	SBProlg	Volume 2 of the 2 volume Story Brook Prolg (SBP) distribution, version 2.3.2. This volume contains the C and Prolg source code. Volume 1, on FF140, contains the Logic Programming Group at SUNY, Story Brook Amiga port by David Roch and Scott Evernden.
Paste	Version of the Unix paste utility. Paste concatenates corresponding lines of the specified files into a single output line (horizontal or parallel merging) or concatenates them into alternate lines (vertical or serial merging). Includes source. By: David Frost.	SmallC	An Amiga port of the Small-C compiler, written by Ron Cain and published in Dr. Dobbs' Journal, in about 1980. Small-C is a rather small subset of the full 'C' language. However, it is capable of compiling itself, and other small, useful programs. Requires an assembler and linker to complete the package and produce working executables. Includes source and binary. Author: Ron Cain. Amiga port by Willi Kusche.

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Fred Fish Disk 142
Dit Program uses same algorithm as Unix diff prog, and produces context diffs, suitable for use with patch. Same as FF138, but now includes the missing files (including source code). Author: Unknown (Docus C diff)

FracGen
 Generates fractal pictures from "seeds" you create. Unlike any of the other "fractal generators", it can be used to load and display previously created fractal pics, modify existing fractals, or create your own fractals. V1.1, binary only. Author: Doug Houck

SciSubr
 Scientific Subroutine Package from DECUS, ported to the Amiga to run with Acorn Fortran. A valuable resource of mathematical and statistical source code for those doing Fortran work on the Amiga. Author: Unknown; ported to the Amiga by Glenn Ewertart

Fred Fish Disk 143
Rim RIM-5 (Relational Information Manager), a full relational DBMS suitable for VERY large databases using B-Tree data storage, crude (by today's standards) user interface, but full source code is provided. RIM runs on a wide variety of systems, small and large, and produces compatible databases. Includes a built in HELP database and a programming language. Full Fortran source code and documentation included. Author: Various, Amiga port by Glenn Ewertart

Fred Fish Disk 144
AnalysCalc V22-30 of Glenn Ewertart's large and powerful spreadsheet program, updated to FF104. Extra features "to have some pretensions of acting as an 'integrated system'". A virtual memory system supporting up to 18000 columns and 18000 rows, multiple equations per cell, an outlining system, built in cell annotation, and database access from any cell(s) of the sheet, plus an array of functions not present in most commercial spreadsheets. Source and documentation in a/c'd form.

Fred Fish Disk 145
Csh Modification of csh like shell to provide file name completion and argument execution. Requires ARP 1.1. Binary only, but includes diffs for the reference 2.07 source base. Author: Matt Dillon; enhancements by Johan Widen

DMouse
 Versatile screen blinker, mouse blinker, auto window activator, mouse accelerator, popdi style programmable command and key, pop window to front, push window to back, etc, widget. Very useful program! V1.06, includes source. Author: Matt Dillon

Net
 Link protoce provides essentially an unlimited number of reliable connections between processes on two machines, where each can be either an Amiga or a Unix (BSD4.3) machine. Works on the Amiga with any EXEC device that looks like the serial device. Works on UNIX with tty and socket devices. Achieves better than 95% average throughput on file transfers. V1.20, includes sources for both the Amiga and Unix versions. Author: Matt Dillon

Tab Tabulate writing program, with instruments for a banjo and string quartet. Binary only. Author: Jeff deHenzon

TinyProlog VT-PROLOG is a simple prolog interpreter provided with full source code to encourage experimentation with the PROLOG language and implementations. Version 1.1, includes source. Author: Bill and Bev Thompson

Fred Fish Disk 146
Blanker2 A screen blanking program that turns the screen black after 90 seconds of keyboard and mouse inactivity. V1.27.88, includes source. Author: Joe Hitchens

C-Light
 A demo copy of a commercial ray tracing program, identical to commercial version but limited to ten objects per scene. Binary only. Author: Ronald Peterson

CrLists
 Complete CRC check files for FF129-141 and FF143-145 of the library, using the arc program from FF133. Made directly from Fred's master library. FF142 limited due to a problem with the arc program. Author: Fred Fish

DmeMacros
 A set of DME macros which utilize templates to turn DME into a language-sensitive editor for C, Pascal, Modula-2, and Fortran. By Jerry Mack

Memopad
 A shareware intuition-based memo reminder program. Nicely done. V1.1, binary only. Author: Michael Griebling

To Be Continued.....

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FF14	FF15	FF16	FF17	FF18	FF19	FF20	FF21	FF22	FF23	FF24	FF25	FF26
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FF144	FF145	FF146										

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